ENGINEERING NEWS-RECORD

A McGRAW-HILL PUBLICATION

Service records here support BYERS Wrought Iron Pipe application here

Selecting genuine wrought iron pipe on the basis of past experience has become a common practice among many of the nation's leading designers. A typical example is the new DePaul Hospital Nurses' Home, St. Louis, Missouri. The outstanding service record established by this time-tested material in the nearby DePaul General Hospital since installation in 1930 provided the best possible support for the use of genuine wrought iron pipe in six vital services in the new building. Byers Wrought Iron pipe was utilized in all steam and return piping, all boiler room piping, water column, pump discharge and blow-off lines. Architects on the job were Maguolo and Quick; Harry F. Wilson was the engineer.

With today's maintenance costs so high, the importance of selecting the most durable material is obvious. The wisdom and economy of using Byers Wrought Iron pipe has been convincingly demonstrated in thousands of successful applications in every part of the country.

Our bulletin, WROUGHT IRON FOR PIPING SYSTEMS, discusses some of the corrosive conditions found in various services and illustrates a few of the many places where engineers have found greater economy in the longer life of genuine wrought iron. Write for a copy.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Division: New York, N. Y.

Why Genuine Wrought Iron Lasts

This notch-fracture test specimen illustrates the unique fibrous structure of genuine wrought iron—which is responsible for the high corrosion resistance of the material. Tiny threads of glass-like silicate slag, distributed through the body of high-purity iron, halt and disperse corrosive attack, and discourage pitting and penetration. They also anchor the initial protective scale, which shields the underlying metal.

BYERS

CORROSION COSTS YOU MORE THAN WROUGHT IRON

WROUGHT IRON

TUBULAR AND HOT ROLLED PRODUCTS

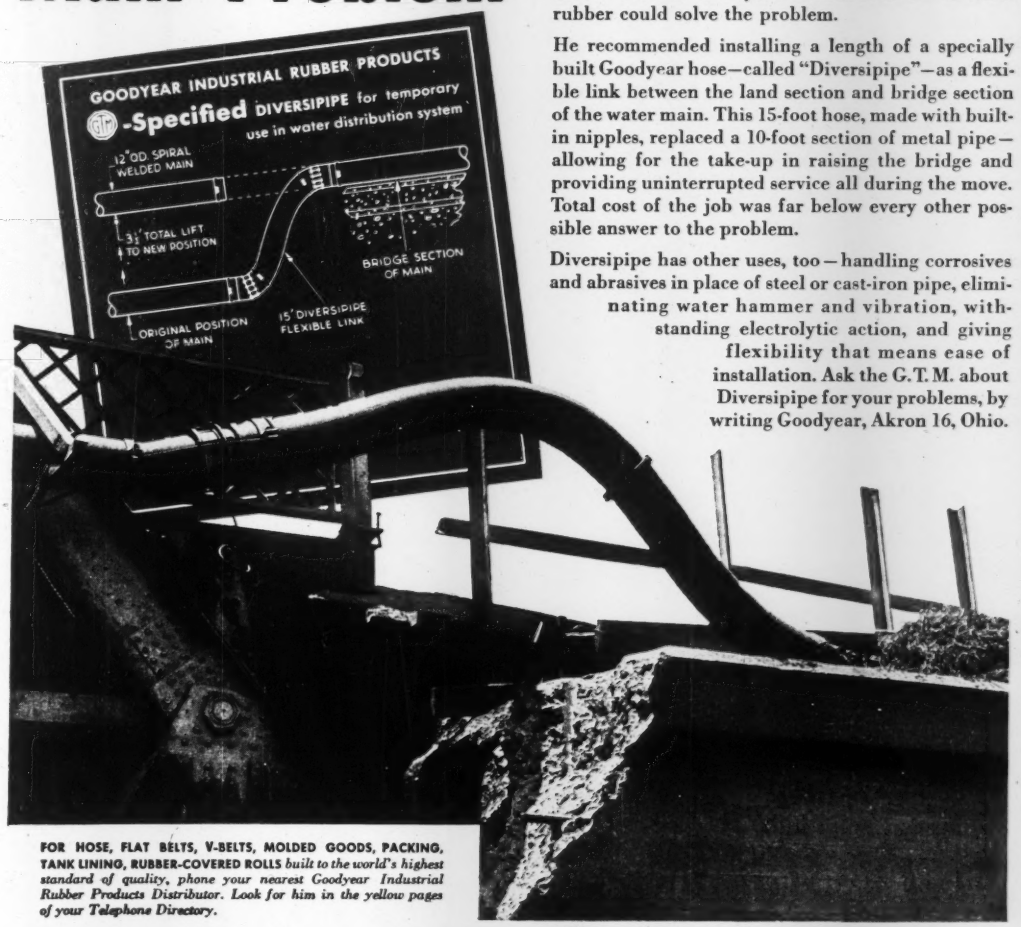
ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

Best Answer to the Main Problem

One end of the bridge you see here had to be raised 3½ feet during a highway-rebuilding project—then anchored at the new height on a new concrete abutment. Problem was this: the bridge carried a water line supplying 400 families, and interruption of service couldn't be allowed during the month and a half it took to do the job. So the project engineer called in the G.T.M.—Goodyear Technical Man—to see if rubber could solve the problem.

He recommended installing a length of a specially built Goodyear hose—called "Diversipipe"—as a flexible link between the land section and bridge section of the water main. This 15-foot hose, made with built-in nipples, replaced a 10-foot section of metal pipe—allowing for the take-up in raising the bridge and providing uninterrupted service all during the move. Total cost of the job was far below every other possible answer to the problem.

Diversipipe has other uses, too—handling corrosives and abrasives in place of steel or cast-iron pipe, eliminating water hammer and vibration, withstanding electrolytic action, and giving flexibility that means ease of installation. Ask the G.T.M. about Diversipipe for your problems, by writing Goodyear, Akron 16, Ohio.


GOODYEAR INDUSTRIAL RUBBER PRODUCTS
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3½' TOTAL LIFT TO NEW POSITION
BRIDGE SECTION OF MAIN
ORIGINAL POSITION OF MAIN
15' DIVERSIPIPE FLEXIBLE LINK

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Stabilized Internal Focusing.
Focusing Slide – Accommodates individual eye.
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Positively Positioned Reflector.
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Interior Permanently Mounted Level Vial to avoid breakage.
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Attached Neck Cord for instant easy access.
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BUZKA Transit

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ENGINEERING NEWS-RECORD

ABP Member ABC

Volume 148 MARCH 13, 1952 No. 11

WALDO G. BOWMAN
Editor

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ROBERT F. BOGER
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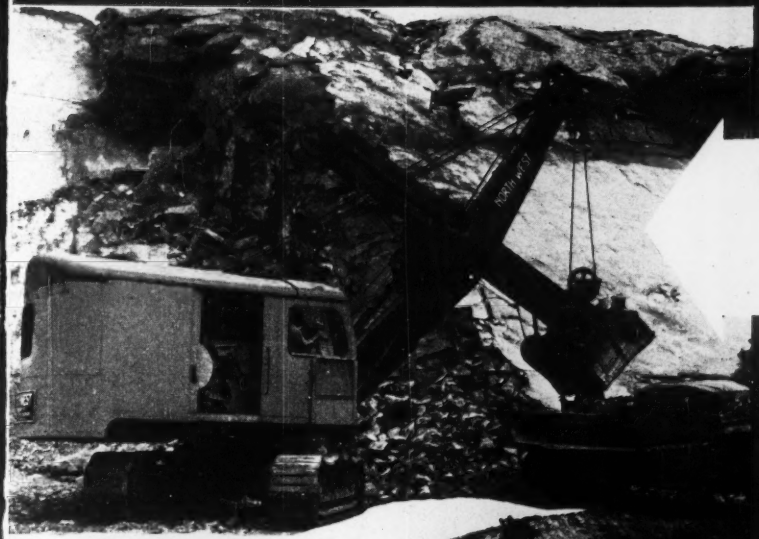
It's another NORTHWEST



When it's built for digging like this...

You can be sure of high output in any kind of digging

Successful Contractors stay successful with good equipment

taking big bites out of construction costs

The Ingersoll-Rand QUARRY-MASTER saves time, effort and expense on all kinds of big-hole drilling jobs.

It's a job proven fact that Ingersoll-Rand Quarrymaster drills have no equal for all-around *big-hole* rock drilling jobs. These drills will save you time and money on road building, dam construction, diversion canals, air-port work, etc. Here's why:

- **Drill Any Kind of Rock**—from the softest shales or over-burden to the hardest granites.
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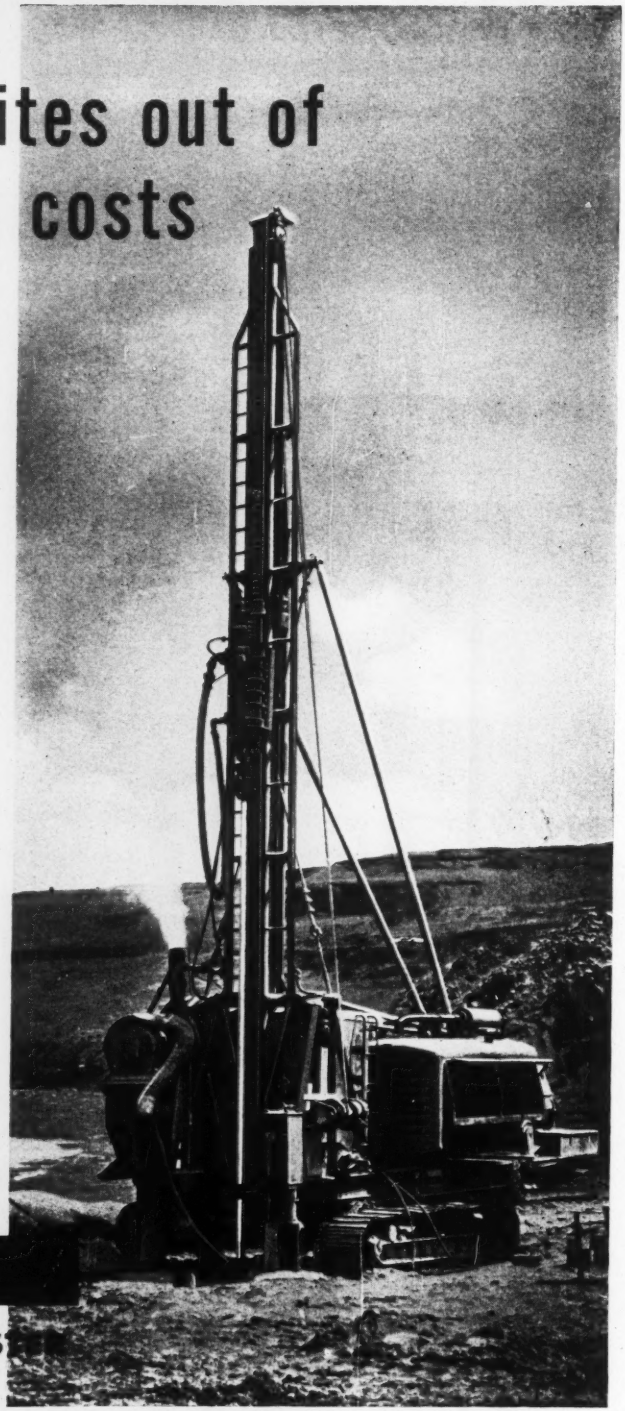


One of the two Quarrymasters being used at the Chief Joseph Dam in Washington.

Ingersoll-Rand

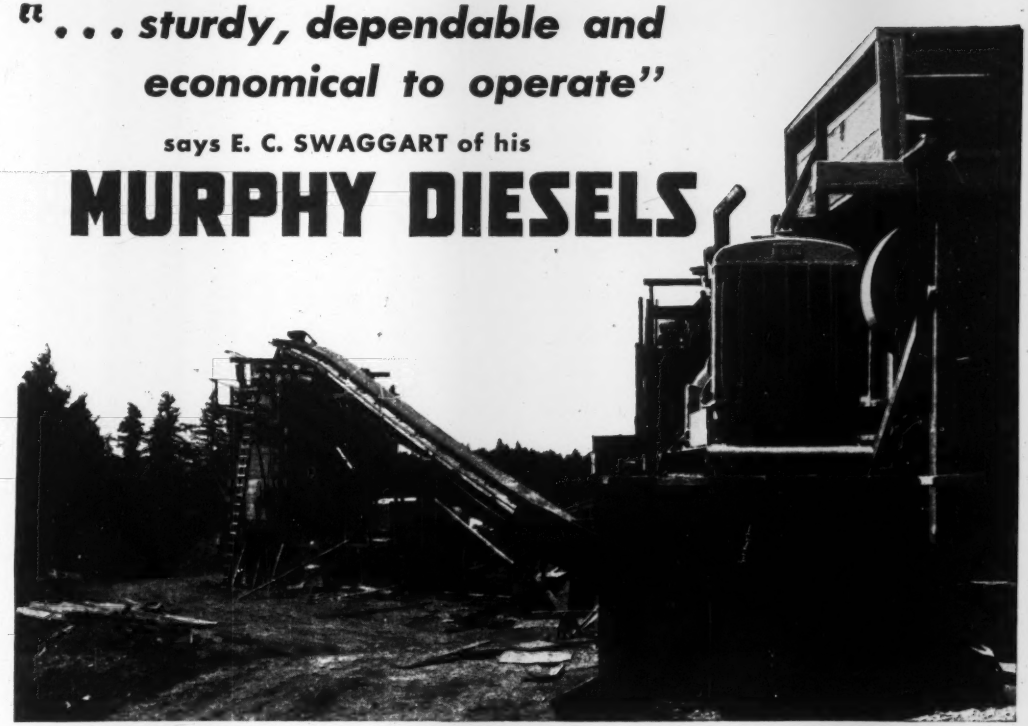
QUARRYMASTER

696 S

"... sturdy, dependable and economical to operate"

says E. C. SWAGGART of his

MURPHY DIESELS



● ONLY the user can be the final judge of the merit of a diesel engine . . . and that's why we're so proud of what Murphy Diesel owners tell us about their engines. The remarks of E. C. Swaggart, a general contractor of Eugene, Oregon, are typical. He recently wrote as follows:

"I have six Murphy Diesel Power Units powering my crushing plants and one Murphy Diesel Generator Set. I have been using Murphys for five years and have always found them sturdy, dependable and economical to operate. For these reasons, and because of Murphy's fast action, if I need another power unit for my rock plants, I would buy a Murphy."

This kind of user loyalty can be built only by a product that delivers the goods.

Murphy Diesel's ability to deliver more power, greater fuel economy, greater dependability and longer life are the result of an exclusive combination of advanced design features. These include "true" diesel operation . . . unit fuel injection . . . four valves per cylinder . . . hydraulic servo-type governor . . . and many others. Full details are given in the booklet *"10 Questions to Ask a Diesel Engine Salesman"*. Ask your Murphy Diesel Dealer for a copy or write direct.

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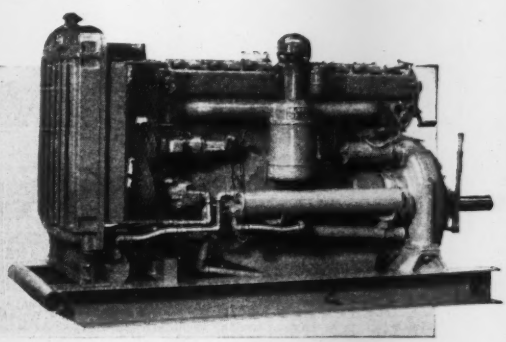
for all services

Murphy Diesel engines and power units are made in sizes from 90 to 226 H. P.; generator sets from 60 to 140 K. W.



LOCK JOINT
CONCRETE PRESSURE PIPE

The Choice of Five Capitals

WASHINGTON, D.C. • U.S.A.

WASHINGTON, D. C. • RIO DE JANEIRO
BOGOTA • CARACAS • CIUDAD TRUJILLO

Five capital cities under five different flags, but with one important factor in common . . . they all have major water supply lines built of Lock Joint Concrete Pressure Pipe.

• • •

This unanimity of choice can be attributed to the sound design, high quality of materials and excellent workmanship which goes into the production of Lock Joint Concrete Pressure Pipe. The ample steel reinforcing provides a rugged pipe which will withstand both high internal pressures and unusually heavy overburdens. Walls of carefully proportioned concrete prevent corrosion or tuberculation assuring durability and permanently high carrying capacity. Flexible expansion joints at every joint provide easy installation and assure permanent water tightness under all conditions of service.

• • •

The test of time has proven Lock Joint Concrete Pressure Pipe lines to be extremely economical to operate, requiring practically no maintenance or repairs throughout an estimated useful life of more than 100 years. Yet the pipe is amazingly low in initial cost.

• • •

For your next water transmission line involving pipe 16" in diameter or larger, specify Lock Joint, the capital pipe chosen by capital cities because of its durability, dependability and economy.

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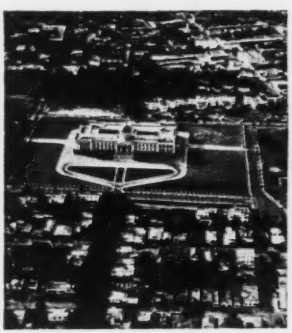

CIUDAD TRUJILLO
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SCOPE OF SERVICES—Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply Distribution Mains in a wide range of diameters as well as Concrete Pipes of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous Lines.

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Est. 1905

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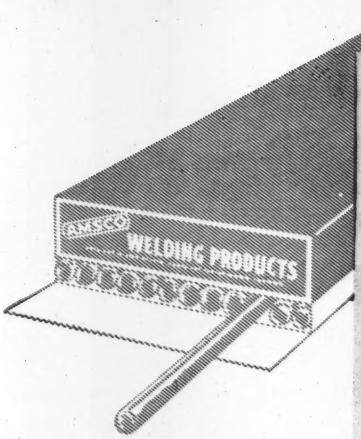
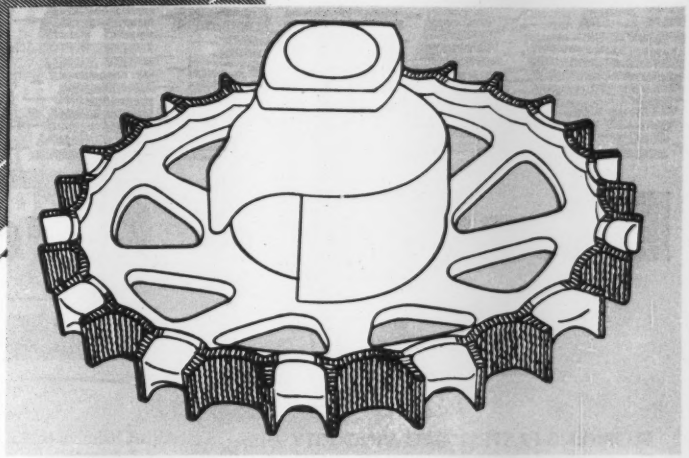
LOCK JOINT
Reinforced Concrete
PRESSURE PIPE



How AMSCOATING with Amsco Hardfacing Rods saves you materials . . . manpower . . . money.



These teeth take bites out of repair costs!

AMSCOATING can make old Tractor Drive Sprockets last 3 times longer than new.

AMSCOATING...stands for control of wear by Hardfacing...

Hardfacing rods—and recommendations for their use—are as sound as the manufacturer who makes them. AMSCO has been fighting wear for a half-century—first with Manganese Steel, and later with AMSCO Hardfacing Products.

If you have a problem of wear caused by impact, abrasion, heat or corrosion . . .

Find out how AMSCOATING can save you materials . . . manpower . . . money!

Here's another way to beat the high cost of replacements, down-time and maintenance . . . AMSCOATING the teeth on Tractor Drive Sprockets. Time after time service records have shown that AMSCOATING of sprockets results in these dollar-saving advantages:

1. ***On an average — 3 times the service life of a new, unhardfaced sprocket.***
2. ***2 out of 3 sprocket changes completely eliminated . . . far less down-time, less maintenance . . . more equipment out of the shop and on the job.***

To top it off, sprocket replacements can practically be eliminated. An AMSCOATED sprocket can be reclaimed over and over again . . . *at about half the cost of a new one!*

Get all the facts on how to make these big savings . . . write today for instruction sheet on AMSCOATING sprockets, and the name of your nearest AMSCO Distributor.

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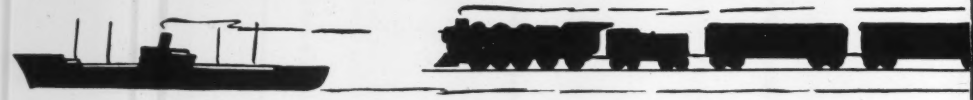
WATER Paces Business Growth!



FLORIDA'S FASTEST GROWING CITY realizes the importance of an adequate water supply to future growth. In addition to the busy harbor and large rail and truck terminal facilities, there are over 450 local industries in Jacksonville, the industrial and transportation capital of Florida.

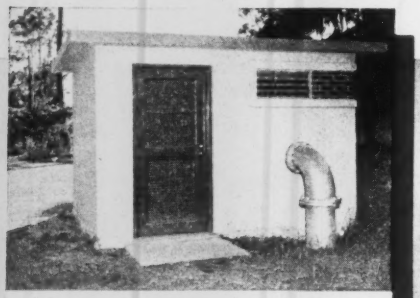
From this modern deep water harbor on the South Atlantic coast, ships fan out to European, South and North American ports. To handle requirements foreseeable for the next decade, Jacksonville is now completing a $7,000,000 water system expansion program under the direction of Utilities Commissioner J. Dillon Kennedy... engineering by Reynolds, Smith and Hills.

The performance record of previously installed Allis-Chalmers equipment (far right) was considered in ordering *thirty-four* new Allis-Chalmers centrifugal pumps and induction motor drives with a total capacity of 73 million gallons a day. Water storage capacity has been raised from 11,570,000 to 22,000,000 gallons and peak pumping rate increased to 94 M.G.D. Maximum daily consumption has been 45,016,000 gallons in the area served.

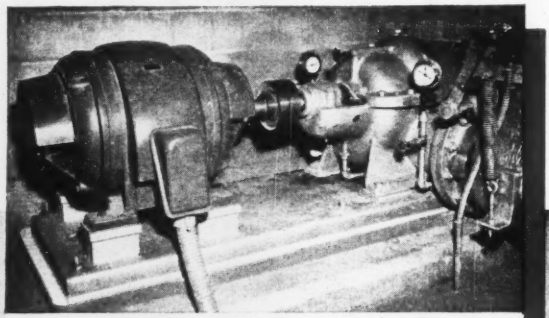
If *you* are planning on expansion or modernization, do as Jacksonville and other leading cities are doing—take advantage of Allis-Chalmers knowledge and facilities for handling municipal pumping problems. Call your nearest A-C sales office or write to Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for illustrated Bulletin 52B6059G.

A-3527

Allis-Chalmers Equipment Used in Water Works Expansion



EACH ARTESIAN WELL formerly supplied water under artesian pressure to the reservoirs where it spilled over splash boards and baffles to eliminate entrained hydrogen sulphide. Modern pump houses containing Allis-Chalmers pumps and motors now raise pressure so that water can be aerated by spraying, and also increase well flow during peak load periods.



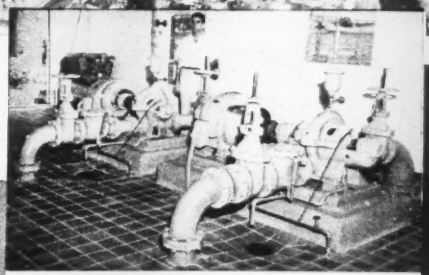
INSIDE A PUMP HOUSE, a 50 hp, 1160 rpm induction motor drives a 12 x 12 in. centrifugal pump rated 3300 gpm against 40 ft head. *Twenty-four* Allis-Chalmers installations were made in pump houses similar to this and eight were installed in underground pump houses. Quietness of operation is an important factor since many of the wells are located in residential areas.

ALLIS-

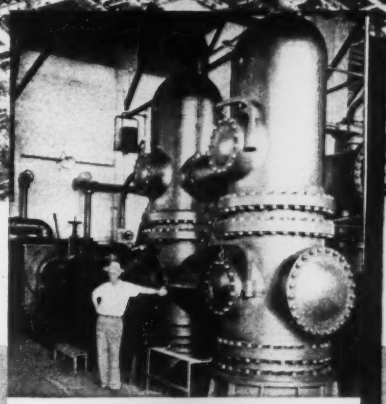
Builders of the

JACKSONVILLE
Florida's Gateway City is Worldwide Distribution Point

Metropolitan Jacksonville, showing terminal facilities and portion of eight-mile developed waterfront on the St. Johns river.



AT HENDRICKS AVENUE pumping station, the two Allis-Chalmers pump-motor teams shown increased capacity 2,664,000 gpd. At left is a 5 x 4 in. centrifugal pump rated 750 gpm at 165 ft head and driven by a 50 hp induction motor. At right is a 6 x 5 in. pump delivering 1100 gpm at 165 ft head and driven by a 60 hp motor. Water storage facilities have been greatly increased.



AFTER 33 YEARS ON THE JOB this Allis-Chalmers veteran steam reciprocating pumping unit is still in daily operation at the Main Street pumping station. Rated 12 M.G.D. against 150 ft head, it is a fine example of the long life built into A-C equipment. City water was first distributed in Jacksonville in 1880 . . . today there are well over 50,000 metered connections.

CHALMERS

A-C ALLIS-CHALMERS

World's Widest Range of Public Works Equipment

on the uses and advantages of FOSTER RENTAL STEEL-SHEET PILING

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The story of how 7 big contractors—on 7 big jobs enjoyed savings, convenience, and dependability on their steel sheet piling requirements. Illustrated for your use in planning are diagrams and dimensions of the more popular sections of Interlocking Steel Sheet Piling. You'll learn that it pays to Rent from Foster—to get the exact lengths and exact sections your job requires—at Foster's low rental rates and without costly capital investment.

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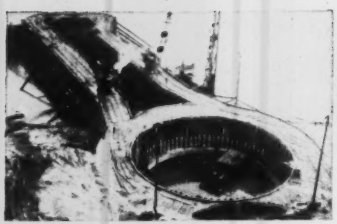
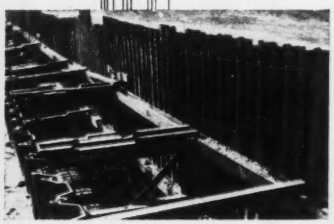
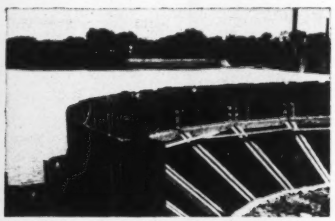


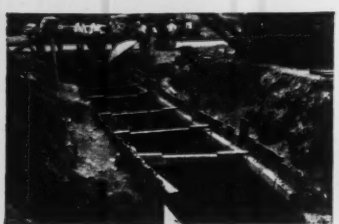
Western Foundation Corp. and Spencer, White & Prentis, Inc., contractors for Union Electric Light & Power Co. plant.



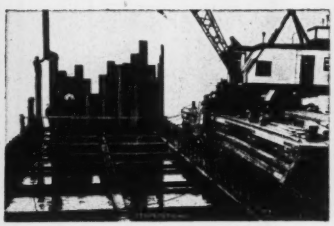
The Subterrane Corp., contractors for Owl's Head Sewage Treatment Works Project, Brooklyn.



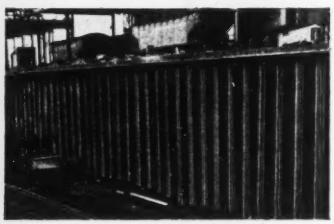
Daniel O'Connell's Sons, Inc., contractors for Holyoke Water Power Co. new plant, Holyoke, Mass.



Fish Constructors and Oklahoma Contracting Corp. contractors for Transcontinental Gas Pipe Line Project, New York section.



Frederick Snare Corp., contracting engineers for Lawrence-Atlantic Beach Bridge, Nassau County, New York.



Morrison-Knudsen Co., Inc., contractors and engineers for Jones & Laughlin Steel Corp. plant expansion, Pittsburgh.

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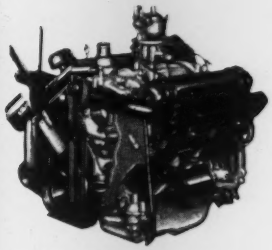
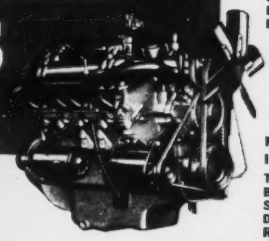
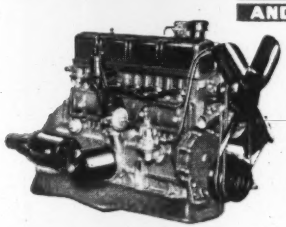


FORD "317" INDUSTRIAL ENGINE
Type—V-8, 90° Overhead Valve.
Bore—3.8 inches.
Stroke—3.5 inches.
Displacement—317 cu. in.
Rating (dyn.)—140 b.h.p. @ 2800 rpm.



FORD "279" INDUSTRIAL ENGINE
Type—V-8, 90° Overhead Valve.
Bore—3.56 inches.
Stroke—3.5 inches.
Displacement—279 cu. in.
Rating (dyn.)—125 b.h.p. @ 2800 rpm.



FORD "215" INDUSTRIAL ENGINE
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Displacement—215 cu. in.
Rating (dyn.)—93 b.h.p. @ 2800 rpm.

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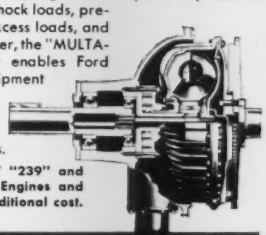

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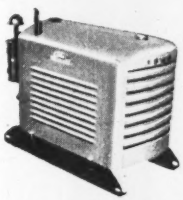

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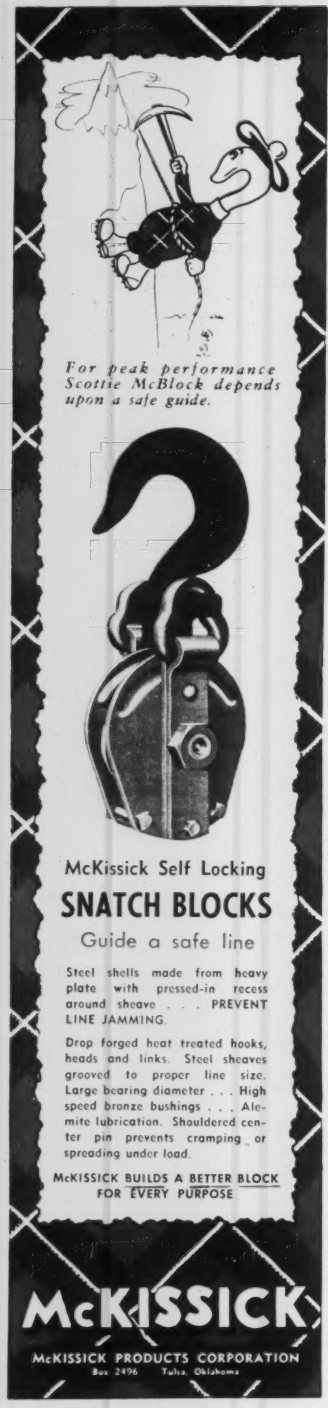
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READER COMMENT

More on flood control

Sir: The discussion of flood control by Gerard H. Matthes in your Nov. 8 issue has evoked a number of replies to which I am adding one more.

We should have some figures as to when the reservoirs behind the wonderful dams we are constructing will be full of mud. Lake Mead, provided by the Hoover Dam, it is stated, will be without storage capacity in 50-75 years. How about those in alluvial country? Will not they fill up much more rapidly?

It seems as though the Army Engineers, Reclamation Bureau and others adding so to our taxes for these dams should be frank and tell the whole story. Figures now given as to kilowatts, flood-control, navigation, etc., are only partially true. The same amount of money spent on contour plowing won't give us the kilowatts or the navigation, but will largely stop soil erosion—a much more long-range, high-grade objective than the other factors.

If we hold back soil erosion, future generations will bless our wisdom instead of cursing our present slipshod methods.

GEORGE R. WADLEIGH
Consulting Engineer
New York

Street cars for traffic relief

Sir: When John G. Kr iling commented on the wisdom of remodeling the Brooklyn Bridge (ENR Dec. 6, 1951 p 49), he mentioned that a modern trolley line could handle as many people in one hour as this new six lane bridge will handle in one day. Yet, our city planners are fast allowing our trolley lines to become "a thing of the past."

We are told that today's street cars are a hindrance to free flowing traffic and a principal cause of traffic conjestion, and that the substitution of busses is the best solution to our present traffic problems. The *immediate* result of this change-over will usually be a speeding up of traffic, but the number of vehicles will also increase. Passengers who once rode on the roomier street cars will not tolerate being jammed into the smaller busses, and many will decide to drive their own cars. The bus company, noting this decline of passengers, will then reduce the service, thus forcing more people to use their cars. The *eventual* result of the change-over to busses will only be more traffic conjestion.

It appears to me that the most effective solution of our traffic problem is not to be found in a vast expansion of our arterial highways, but rather in the improvement of our public transportation systems, either rapid transit or surface lines. For instance, modern street cars, operating on a separate right-of-way where possible (similar to Canal Street in New Orleans), can offer the public speedy, comfortable, and dependable transportation. These cars have large seating capacity and are even air-conditioned in the summer months. Thus, if the public were assured of such good transportation, it may soon decide to leave the family car at home again.

With public confidence once more restored in street-car service, our cities may well be spared substantial portions of the tremendous costs of widening streets and building more expressways and parking garages.

FRITZ R. PANSE
Brooklyn, N. Y.

Overpayment of labor

Sir: You did an excellent job completely reporting the case of the War Stabilization Board vs Hedin Construction Company (ENR Jan. 31, p. 23). However, we question whether the prosecutor has completely covered the violation in this instance. Regulations as issued by WSB state:

". . . no wages, salaries or other compensation may be paid to **or received** by mechanics and laborers in the building and construction industry . . . in excess of the payments preapproved by this regulation. . . ."

To date I have only seen evidence that contractors are to be prosecuted. Someone is also guilty of taking over the ceiling wages. Complete prosecution will make both the enforcement of this law and compliance with it much easier.

WALTER P. WILKINS
Saginaw, Mich.

Long-span Quonset

Sir: I wish to call attention to an error in the article entitled, "Now the long-span, high-ceiling Quonset," published in your Dec. 20, 1951 issue, p. 35. The columns are made up of two shop-welded C-sections of 6-ga material; not 14-ga as stated in the article.

HERBERT K. LEWIS
Great Lakes Steel Corp.
Stran-Steel Division
Detroit, Mich.

Drawing photographed by Veterans' Administration

Penta protects wood in VA hospital

Over one hundred thousand board feet of lumber for the John B. Cochran Memorial Hospital, being built in St. Louis by the Veterans' Administration, will be protected by penta preservative.

Thirty-five thousand board feet of lumber used as sub-sills below windows was pressure-treated to retain 6 pounds of penta preservative per cubic foot. Outside doors, sash, frames and 1,350 outside windows were dip-treated with penta. Penta now is named in more than 50 government specifications.

Monsanto Penta (pentachlorophenol, technical) is a stable chemical produced specifically for wood preservation. It protects against termites and other wood-boring insects. It prevents decay due to fungi. Penta does not leach . . . does not wash away in rain or ground water. Treated with properly formulated Monsanto Penta, wood can be be painted or varnished.

For information on the use of Monsanto Penta, which gives wood durability sufficient to replace hard-to-get steels in many applications, contact the nearest Monsanto Sales Office or write MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1759-C South Second Street, St. Louis 4, Missouri.

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John B. Cochran Memorial Hospital, 500-bed structure being built in St. Louis by the Veterans' Administration. Architect: Technical Service, Veterans' Administration, Washington, D. C. Contractor: Del E. Webb Construction Co., Phoenix, Ariz., and Los Angeles, Calif. Wood Treaters: Associated Wood Preservers and Gravois Planing Mill, both of St. Louis.

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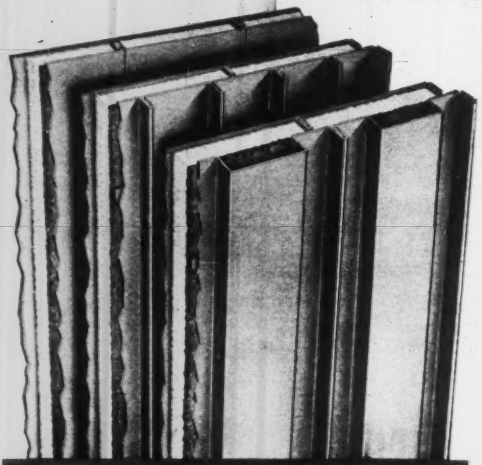

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Over-all "U" Factor of Various Types is Equivalent to or Better than Conventional 16" Masonry Wall

As further evidence of the trend to Insulated Metal Walls in modern construction, the new plant recently built for Quaker Oats in Omaha, Neb., is presented. A second plant for Quaker Oats is now nearing completion in Chattanooga, Tenn. Mahon Insulated Metal Walls with Aluminum exterior wall plates, coping, flashing, etc., and Mahon Steel Deck Roofs, were employed to good advantage in the construction of both of these completely new and modern plants. Mahon Insulated Metal Walls can be furnished in the three distinct exterior patterns illustrated at left . . . they are available in two "Field Constructed" types, and in two types of "Prefabricated Panels". Walls of the "Field Constructed" type can be erected up to fifty feet in height without horizontal joints—a feature of Mahon walls which is particularly desirable in power houses or other buildings where high expanses of unbroken wall surface are common. For complete information on this modern, permanent, firesafe Wall and Roof Construction see Sweet's Files, or write for Catalogs No. B-52-A and B.

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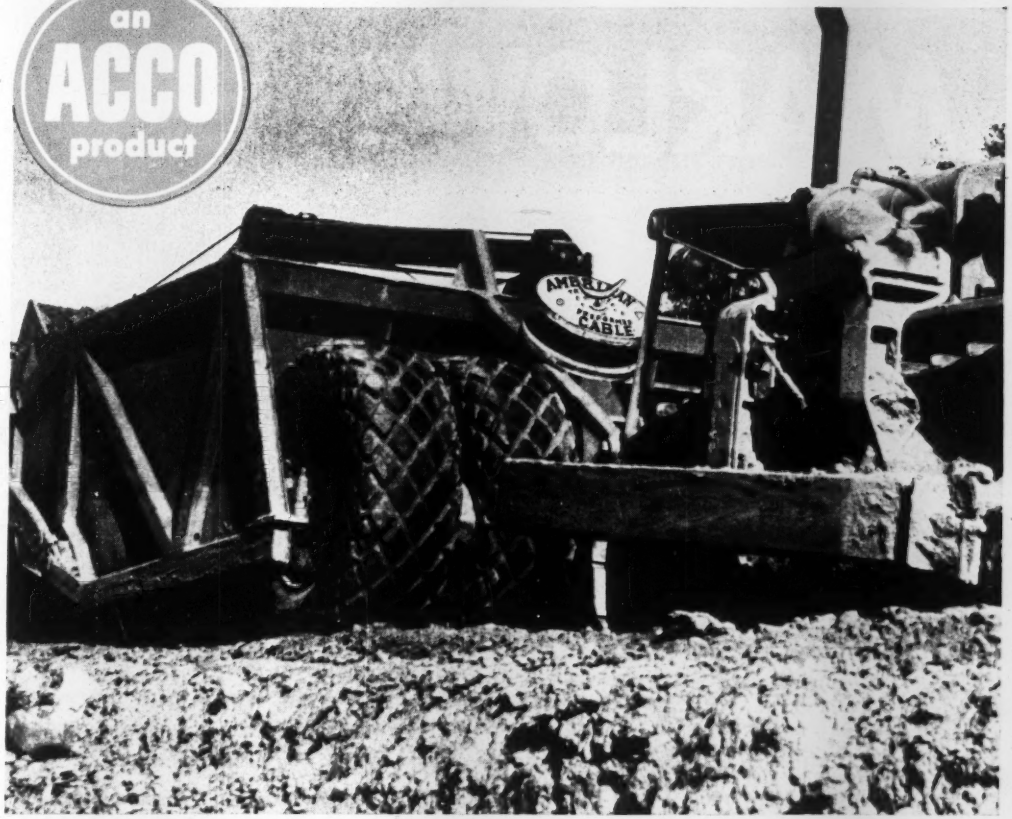

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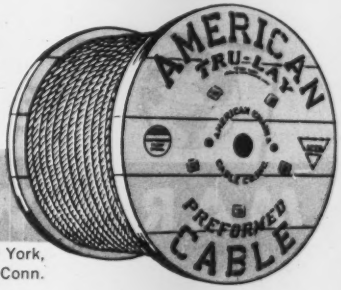

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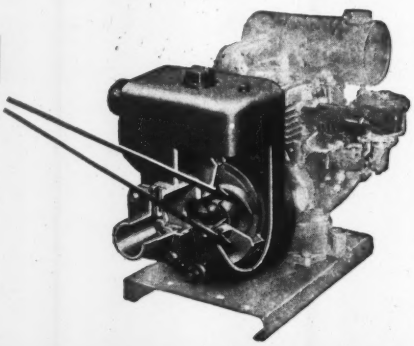

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MARLOW PUMPS

NON-FERROUS METALS—THE PINCH BEGINS TO EASE

Non-ferrous metal shortages won't be nearly as bad as was expected. That's now clear. Shortages of lead and zinc may soon disappear entirely. Copper and aluminum—the non-ferrous metals most important for construction—will stay scarce much longer. But even here, signs of improvement are all about.

The new—and better—supply outlook for non-ferrous metals comes from three main sources: a stretchout in the U. S. defense program, prospects for bigger imports of metals, and an expected pick-up in scrap collections.

The defense stretchout has received the most publicity. By cutting military requirements, it adds substantially to metal supplies for civilians. NPA quickly added about 5 million pounds of aluminum, 5.5 million pounds of copper and 250,000 tons of steel to non-defense allocations for the second quarter. Now an additional 30 million pounds of aluminum and 20-25 million pounds of copper are slated for reallocation.

Only part of this metal is going to construction, of course. But now builders can count on getting more metal in the future. That's especially true for aluminum: Much of the increased production expected later this year will go to civilian industry—including construction—instead of the military.

Civilian industry won't get so much extra copper as a result of defense rescheduling. But the new schedule will still help. It means that military requirements for copper will stay fairly steady in 1952, instead of rising through most of the year.

• **Imports**—Better imports are part of the new picture in non-ferrous metals. Imports dropped sharply last year—mainly because foreign prices went far above our controlled prices at home. That made shortage in the U. S. much worse than they would otherwise have been, since imports supply a big share of all copper, lead and zinc used in the United States.

But now foreign prices are dropping—and imports are expected to rise. The U. S. broke the foreign price of lead, which went as high as 25 cents a pound at one point, by refusing to pay more than the domestic ceiling price of 19 cents. Result: Lead imports are picking up fast, and the government has removed all restrictions on the use of lead.

The same thing may happen to zinc. It went as high as 32 cents a pound abroad, compared to 19½ cents here. Now it's down to 22 cents, and imports should be rising soon. When the foreign price hits our domestic ceiling, end of the zinc shortage will be in sight.

The story in copper is different. Foreign "premium" prices are still 40 cents or more a pound, against a U. S. ceiling for imported copper of 27½ cents. But even this is an improvement. Foreign prices once were as high as 60 cents a pound. As things stand now, copper imports probably won't get back to 1950 levels for some time. But any continued drop in the price abroad is likely to be accompanied by some improvement in U. S. imports.

• **Scrap**—Scrap collections should be rising soon, too—for all of the volume non-ferrous metals. Collections have been way down. People have been using metal more carefully, thus generating less waste; and the trade believes there has been some hoarding. But a lot of the hoarded scrap should start appearing now that shortages are not so acute. And a lot of scrap may show up in Europe. Now that foreign prices are falling, it won't pay to hold scrap there much longer.

• **The Outlook**—These improvements in the non-ferrous metal picture certainly do not mean the end of all shortages. Copper, in particular, is likely to be short through 1952. But the pinch is certainly easing, and it promises to ease some more.

The effect of this easing for construction is already showing up—and not only in bigger allocations of copper and aluminum. It also plays a part in the rush of new orders from Washington easing controls on commercial building, school building and other types of non-defense construction.

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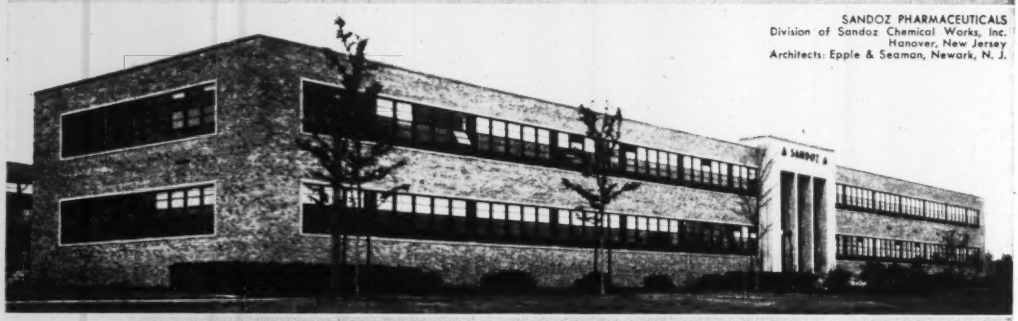

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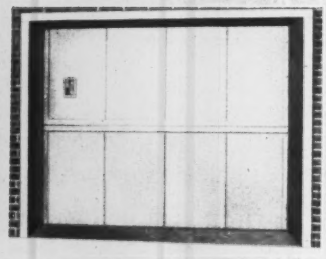

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EDITORIALS

Bargaining by professionals

IT WILL COME AS A SHOCK to many engineers to learn that nearly 15,000 engineers—most of whom are registered professional engineers—were represented at the conference on collective bargaining held in Chicago Feb. 22-24 (ENR March 6, p.105).

Chief purpose of the Chicago meeting was to explore the possibilities of setting up a coordinating national association similar to the National Professional Association of Engineers, Architects and Scientists, which sponsored the conference. That association is made up of five bargaining groups on the West Coast. It could serve as the coordinating agency by minor changes in its constitution.

This meeting in Chicago is noteworthy as an indication of the number of engineers now enrolled in bargaining groups limited chiefly to registered professional men. The 34 groups of that character invited to participate in the Chicago conference have a total membership larger than that of the National Society of Professional Engineers. Most of the men in these groups are employees of large corporations—General Electric, Westinghouse, Western Electric, Bell Telephone, Boeing and some of the oil companies. Between 1,000 and 1,500 are civil engineers.

In all the big manufacturing companies employing the bulk of these engineers, collective bargaining with their employees is a routine matter. As engineers increased in number in those companies they suffered for lack of organized representation in matters relating to pay and employment conditions. So they turned to collective bargaining. And as they would have had little voice and less understanding of their peculiar problems in the large trade unions, they set up their own bargaining groups. Most of these groups now are officially recognized by the employers.

What is the significance of this development to the engineering profession?

First, it points clearly to the probability that collective bargaining by engineering employees will increase rather than decrease in the years ahead. As organizations increase in size, the employees have less and less personal contact with their employers.

In the second place, this trend points to the need for the profession to take a more rational and a less emotional approach to collective bargaining, just as it changed its attitude toward licensing of engineers 20 years ago. Licensing was just about as unpalatable to most engineers when it was first proposed as is collective bargaining today. Possibly it is too much to expect the profession ever to do much to help these collective-bargaining groups. Yet if there ever is to be any real unity from top to bottom of the engineering profession, the major societies will at least need to respect the right of engineering employees to bargain collectively. Certainly, exercise of that right no longer should be characterized as unprofessional, as has been done so frequently in recent years.

Limit design gets cool reception

AN ENTIRE SESSION at the American Concrete Institute convention in Cincinnati was devoted to presentation of the theory of ultimate-load design (ENR March 6, p.100). While no new evidence of great significance was tendered to bolster the theory, the session nevertheless was very useful in calling attention to this highly important philosophy of structural engineering.

In ultimate-load design, or limit design as it is generally called, members are proportioned to sustain without failure selected multiples of the working loads. In contrast, in design by the elastic theory members are proportioned so that under working loads unit stresses do not exceed certain percentages of the ultimate strength or the yield point.

Proponents of limit design contend that test results for bending stresses in reinforced concrete beams are more in agreement with this theory than with the elastic theory. Since limit design would be more economical of materials, they urge its adoption.

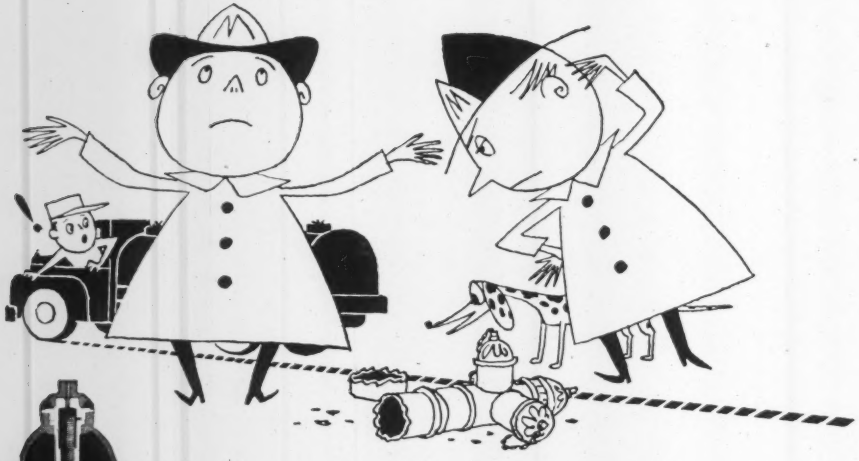
The argument for limit design, however, does not rest alone on possible economies. There is also the matter of consistency in design procedures. Since columns are proportioned by limit design and beams by elastic theory, members subjected to bending and direct stress may be designed by either method with quite different results. Limit design offers the possibility of a unified theory for beams, columns and members under combined stress. With limit design, too, safety factors could be made more uniform because they are applied directly to the loading rather than to the unit stresses.

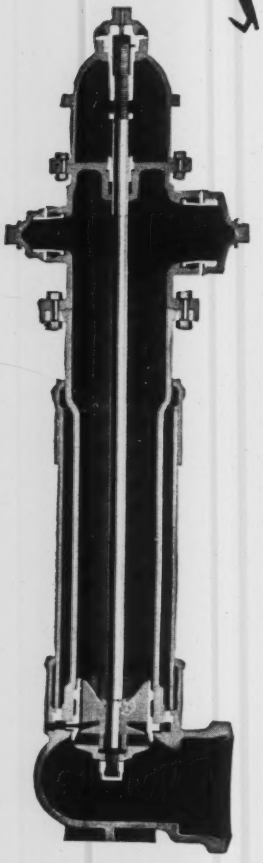
A sampling of the opinion of engineers attending the ACI session indicates that acceptance of limit design will be slow—not that its advantages are questioned, but many unknowns still plague designers. How, for example, does the theory apply to bond and diagonal tension? What about impulse loads, fatigue and vibration? What load factors should be used for various structures and loadings so that all will have equal reserve strength?

Few doubted that limit design would be a valuable tool in the hands of experienced engineers, but almost all feared its mis-use by inexperienced designers.

Perhaps, if time had been made available at the ACI session on limit design for more discussion from the floor, some of these misgivings would have been allayed, so that much more could have been accomplished at this meeting. The session, nevertheless, did arouse greater interest in the theory even though its acceptance was marked by coolness.

Broken hydrant cannot leak!





The main valve opens against water pressure and closes with it. This is foolproof protection against flooding when hydrants are broken in traffic accidents.

MATHEWS
HYDRANTS

Made by R. D. Wood Company, Public Ledger Building, Independence Square, Philadelphia 5, Pa. Manufacturers of "Sand-Spun" Pipe (centrifugally cast in sand molds) and R. D. Wood Gate Valves

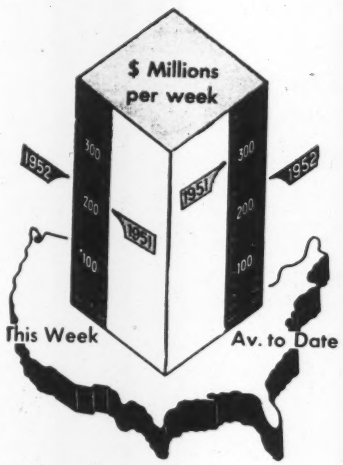
Mathews Modernized Hydrants . . . Tops in Convenience and Dependability Compression-type valve prevents flooding • Head turns 360° • Replaceable head • Nozzle sections easily changed • Nozzle sections raised or lowered without excavating • Protection case of "Sand-Spun" cast iron for strength, toughness, elasticity • Operating thread only part to be lubricated • All working parts contained in barrel • A modern barrel makes an old Mathews good as new • Available with mechanical joint pipe connections

THE CONSTRUCTION WEEK

SCRUTINIZE AEC PLANS—The Senate-House Atomic Energy Committee is going to give atomic plant construction plans close scrutiny. Last week it appointed an advisory panel headed by Lewis L. Strauss, a former member of the AEC and now a consultant on atomic energy. He will be assisted by eight other members and they will have the help of specialists in architecture, engineering and construction. Their mission: to examine atomic plants being built and submit detailed technical reports. Purpose: to help the committee monitor and evaluate critical phases of the plant construction program.

WATER GRAB CHARGED—Arizona's Gov. Howard Pyle is seeking a congressional investigation of alleged California waste of Colorado River water. He charges 10 million ac-ft is being dumped out of Lake Mead to make room for an expected 15 million ac-ft runoff this summer—and is flowing out into the Gulf of California unused. Further he charges California is using political power to block other Colorado River Basin states from using their own water. His move is viewed as part of an effort to obtain the $217-million Central Arizona Project to transport Colorado River Water to agricultural areas as far south and east as Tucson.

VALLEY OF POLLUTION—The latest U. S. Public Health Service pollution abatement reports shows that sewage systems costing about $400 million are needed in to clean up the drainage basin of the Ohio River. The basin takes in an area of 163,000 sq. mi., has a population of nearly 17,750,000. In all, the basin has nearly 3,400 sources of polluting wastes. These sources include 2,104 municipalities and 1,264 industries which discharge directly into streams. Existing facilities of some type are now treating wastes from more than 1,000 of these sources. New treatment plants are required for 911 municipal and 539 industrial sources. Enlargements and additions are needed at 240 locations and 72 deficient treatment plants should be replaced.



Contracts by type of work

	This Week	Cumulative 11 wks 1952	1951	% chge
Waterworks	$2.5	$52.7	$42.2	+25
Sewerage	3.3	39.9	69.1	−42
Bridges	11.8	59.3	58.6	+1
Highways	28.1	120.8	193.0	+14
Earthwork, Waterways	15.4	84.5	65.6	+29
Buildings:				
Public	24.9	333.1	510.6	−35
Housg., pub.	13.3	183.5	148.2	+24
Housg., priv.	84.5	589.9	463.7	+29
Commercial	4.6	82.8	163.4	−49
Industrial	14.3	551.5	1,376.6	−60
Unclassified	21.7	297.7	279.3	+7
Total	**$223.8**	**$2,505.7**	**$3,369**	**−26**

NOTE: Minimum size projects included are: waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

ENR COST INDEX

Index Base = 100		1913	1926	1949
Constr. Cost	Mar. '52	550.60	264.67	115.42
Bldg. Cost	Nov. '52	407.21	220.12	115.75
Volume	Feb. '52	386	157	112

IN THIS ISSUE—Mobilizers take another step toward easing restrictions on construction (p. 23). . . . New controls orders on general construction and home building go into effect (p. 26). . . . Active week for highway plans (p. 28). . . . ASCE New Orleans session proves fruitful (p. 31). . . . NPA compliance division will step up enforcement (p. 34). . . . Construction costs creep up (p. 38). . . . Wage Stabilization Board accuses homebuilder (p. 44). . . . Civic center to replace slums in Pittsburgh (p. 47). . . . Construction is tricky on warehouse and building (p. 51). . . . Skew bascule design puts bridges inside budget limit (p. 53). . . . Contractor rescues dredge after six-month mud bath (p. 54). . . . Pavement load deflections measured by mechanical subgrade (p. 58). . . . How to harden an airport runway base (p. 60). . . . Water main with sulfur joints suffers 69th baffling break (p. 62). . . . Massive composite piles developed for off-shore site (p. 64). . . . Concrete huts withstand A-bomb tests (p. 84). . . . Public agencies compete for money (p. 95). . . . Puerto Rico makes progress on $26-million water development (p. 99). . . . New honor comes to Albert T. Goldbeck (p. 103). . . . Florida plant turns sea shells into cement (p. 156).

Double Duty Traffic Marker

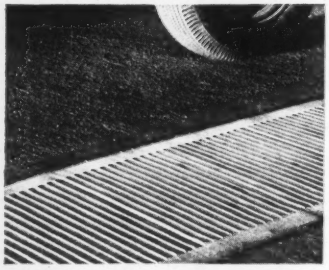
gives safety warning day and night . . . by sound and sight!

This traffic-lane separator not only *shows* where lanes are . . . it sounds off with an *audible* warning when car tires cross over it. It is a corrugated concrete safety strip made with Atlas White Cement set flush with the highway surface. The principle of operation is simple.

BY SIGHT: In daylight, Atlas White contrasts strongly with the adjacent pavement so the strip clearly defines traffic lanes. After dark, headlight rays bounce back from the ribbed surface. The strip becomes a ribbon of reflected light . . . and gleams even brighter when wet with rain, giving greater visibility when most needed.

BY SOUND: The moment a driver ignores the visual warning and turns out of lane, his tires hum or whine on the corrugated surface. The warning is unmistakable day or night.

This sound-and-sight Marker is an effective way to channelize high-speed traffic safely and efficiently. If you are planning a new highway or improving an old one, write for further information to: Atlas White Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

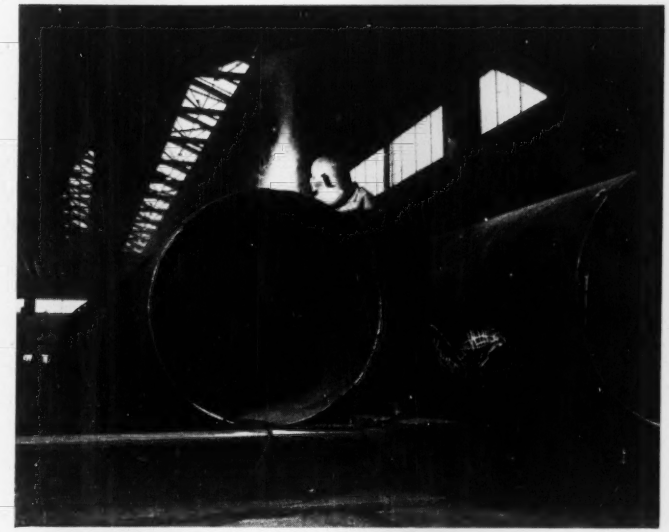


CLOSE-UP of traffic marker shows corrugations scored in concrete made with Atlas White Cement. The white-ribbed surface reflects light back to driver at night . . . contrasts by day . . . sounds off with a distinct hum-m-m when tires roll over it.

ATLAS® **WHITE CEMENT**
For Concrete Reflecting Curb and Markers

ENR-RM-73

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network*



EASING STEEL SUPPLIES help force gradual relaxation of building controls. Here a gas pipe is fabricated at the American Bridge Division for U. S. Steel's new Fairless Works at Morrisville, Pa. But fabricators' backlogs are dwindling.

More metals, fewer curbs aid non-defense projects

Mobilizers backed off another notch on construction controls last week. They authorized construction of 105 new commercial structures to cost a total of nearly $54 million in seven cities where construction activity is slack.

Henry H. Fowler, administrator of the National Production Authority, said demolition, site clearance, excavation and other preparatory work can begin at once to relieve unemployment in the building trades.

Materials will be granted for delivery after July 1. The projects (see table on this page) are slated to receive 20,075 tons of carbon steel, including 6,828 tons of structurals and 585,032 lb of copper.

This action brought the amount of commercial construction authorized during the last month (936 projects) to a value of $400 million—against a total backlog of commercial building estimated by Engineering News-Record at close to $8 billion.

Under pressure from easing supplies in steel and aluminum, mobilizers are approaching controls suspension in easy stages. But they are beginning to make measurable headway.

I. Policy change forged

New commercial construction authorizations are visible indications of changes in policy Defense Mobilization Director Charles E. Wilson is forging. They affect the construction industry right down to its roots.

Last week he told the Senate Banking and Currency Committee he would need a two-year extension of price, wage and other economic controls if the nation is to reach the goals of military strength set for the end of 1954.

He said there has been "some easing" of shortages of steel, copper and aluminum, but it is too soon to know for certain whether the easing will continue. But he indicated that as demands let up, curbs will be progressively relaxed.

Controllers are beginning to talk about techniques for putting controls in reverse. They may go back to simple "DO" ratings. That's how things began, before CMP went in last June. And where simple priorities won't do the job, spot directives will be used to free bottlenecks.

Despite these decontrol trends, a strong defense act will be passed. Congress may work out some gimmick for automatic decontrol for surplus items. But it won't force Wilson to relax on materials still short, and still pushing price ceilings.

In effect Wilson told the committee: "Give us a chance to see what should be decontrolled and give us a chance to do it before you write any decontrol provisions into the act."

Mobilizers make it plain that when they decontrol or suspend controls it will be on an item-by-item basis. They don't think a formula covering decontrol on a broad basis is practical.

Because of the stretching out of military production goals they think that you may see a number of materials controls suspended within eight to ten months. But before that they will make more available for non-defense construction until it becomes obvious that there's enough for everybody.

II. Confusion on aluminum

Timothy A. Lynch, director of NPA's Aluminum and Magnesium Division can find no decontrols in sight in the foreseeable future.

"Instead of decontrol, we believe that, after military and defense supporting requirements are covered, civilian allotments should be increased to take care of hardship cases, small business, new business, and to bring everyone up to an economic operating level."

His opinion is not shared by aluminum industry officials who thronged to Washington last week seeking: (1) relaxation of controls to permit faster

New Commercial Projects Authorized

Area	Number	Estimated Cost
New York metropolitan area (N. Y. City and northern N. J.)	35	$17,857,447
Washington, D. C.	22	15,463,300
Boston	7	1,470,682
Portland-Seattle	15	4,733,838
Los Angeles	17	11,198,740
San Francisco	9	2,954,428
Total	105	$53,678,435

I. W. WILSON, president of Alcoa, says the problem is how to distribute the aluminum now being produced.

CHARLES E. WILSON, defense mobilizer, has temporarily shelved plans for more aluminum expansion.

Curbs easing . . .

(*Continued from p. 23*)

distribution of available aluminum to non-defense users, and (2) to persuade Wilson to shelve plans for a third round of aluminum expansion.

Supporting relaxation of controls, David P. Reynolds, vice president in charge of sales for Reynolds Metals Co., told a Senate Small Business Committee that "without endangering national security, as reflected in current military requirements, all the signs point to an increasing supply of aluminum for civilian use each quarter as far ahead as we can see."

A few days earlier, Donovan Wilmot, vice president of Aluminum Co. of America, as chairman of the Prime Aluminum Products Advisory Committee, urged NPA to channel available aluminum into industries now suffering cutbacks. Listed for special attention was building materials.

Specifically, the advisers recommended:

(1) Aluminum order M-5 be revised to permit manufacturers to accept orders up to 125% of their present production directives in place of the 100% limitation on acceptance of orders which now prevails.

(2) Fabricators be permitted to sell up to 5% of their available supply of metal on unrated orders—without CMP tickets—provided they do not materially increase the consumption of other critical materials.

(3) In making allotments of aluminum for the third quarter, DPA should consider allowing a 25% attrition factor. This would give the industry a latitude in replacing canceled and deferred orders.

• **Definite easing**—Soft spots are developing fast in the aluminum supply picture. On Feb. 7, Alcoa issued a release stating:

"Curtailment of the amount of aluminum permitted by the NPA to be manufactured into extruded shapes during the first quarter of 1952 has resulted in the laying off of about 250 employees at three extrusion plants."

They were still laid off as this was written. Commented one Alcoa official:

"These are not in any sense the only layoffs that have resulted from the inflexibility of the allocations program. In previous months we have had rather sizeable layoffs at certain of our sheet-rolling operations. And at some of our extrusion plants, this is not the first batch of layoffs, but the second and even the third."

Alcoa, largest producer in the industry, is by no means feeling the pinch alone.

• **Get jolt**—It came as a real shock to the aluminum industry last week, therefore, to hear DPA Administrator Manly Fleischmann propose discussion of plans to increase aluminum supplies drafted by DPA aluminum "czar" Samuel W. Anderson.

Fleischmann and Anderson were seriously weighing a long-term contract with Aluminum Company of Canada for importation of 3.5 billion lb of aluminum over a seven-year period. They also thought domestic producers should be building facilities to produce another 280 million lb of aluminum annually—in addition to all present expansions now in progress.

It was this proposal that brought Alcoa's President I. W. Wilson to Washington. Fleischmann and Anderson met with an indignant group of producers the following day. Defer expansion discussions; let's talk about how to use present capacity, they said.

On the following day Charles E. Wilson called a meeting of copper producers—excluding the aluminum producers—for the purpose of discussing bigger aluminum supplies. They, too, proved cold to the idea. By week's end it appeared as though further aluminum expansion plans have been shelved—at least for the present.

III. Steel expansion mapped

Despite sagging demand for some types of steel, plans by two companies for still further expansion were in the news last week. Significantly, both are on the West Coast.

Henry J. Kaiser, voicing optimism over continued demand in the West, announced that the Kaiser Steel Co. will spend another $65 million to construct facilities at its Fontana, Calif. plant. It will increase the company's pig iron output by 50% and its steel ingot production by 11%.

A third blast furnace, scheduled for completion in spring 1953, will produce 438,000 tons of iron annually. A new open-hearth furnace, the ninth to be built at Fontana, will have an annual capacity of 156,000 tons of steel ingots. It is expected to start producing in December.

Construction of a $44-million pig iron plant near Sacramento, Calif., for Yolo Steel and Metal Co. is to be aided by fast tax write-offs as essential to national defense. So is the Kaiser expansion.

Interesting point in West Coast steel expansion: In 1951, of 6 million tons of steel mill products consumed in seven Western states, 2.4 million tons were shipped into the area from mills east of the Rockies.

• **Future cloudy**—For the construction industry, improved steel supply and further expansion are making future plans brighter. But a cloud still hangs on the horizon—threat of a steel strike.

Last week the Senate Banking Committee called Wage Stabilization Board Chairman Nathan P. Feinsinger to explain the board's policy in the steel industry wage dispute.

One Senate fear: WSB may recommend a pay boost so high the steel companies will go along with it only if they can get a price increase of $8 a ton. If stabilizers reject the $8-a-ton price boost, the steel industry may "invite" a strike, and wait for public pressure to build up until the government is forced to end it by meeting industry's terms.

Two steel company officials last week registered sharply worded pro-

tests against the $3-a-ton price increase stabilization officials are considering to mollify a proposed 20-cent hourly wage increase for steelworkers.

Clarence P. Randall, president of Inland Steel Co., branded it a "maneuver" to pave the way for wage boosts "by proposing a prior and insufficient price increase."

Jones & Laughlin Steel Corp.'s Chairman of the Board Ben Morecll also blasted the proposed government formula for settling the current dispute as "unfair and impracticable" and "a break of good faith."

• **Supplies easing**—Although the supplies of structurals, plates, and a few other sections are still tight, there is a definite loosening in certain other shapes—notably hot and cold rolled sheet.

For more than a month now, producers of building materials who have the CMP tickets have been able to place orders more easily and get more rapid delivery. Sometimes it takes some "shopping around," but premium prices are becoming passe.

And even though supplies of structurals are below the demand, fabricators' business is off. They are working their way through backlogs faster than the volume of new CMP authorized orders are coming in. The total volume of structurals involved in the last three DPA releases on commercial construction is only about 42,000 tons—over nine months starting July 1. This compares with a quarterly output of structurals for construction of about 850,000 tons.

IV. Copper to remain tight

The director of the National Production Authority's copper division, P. B. Andrews, told a congressional committee last week that demand for copper exceeds NPA's most optimistic supply estimates. He made a statement with a familiar ring:

"When the time comes to decontrol copper," Andrews said, "we should approach it by first easing existing restrictions on the use of copper for certain purposes, and second, by increasing allotments for those industries that have been cut back."

The mobilization cutback will help some, by making copper available for some more urgent civilian requirements. The armed services have turned back nearly 20 million pounds of brass and 5 million pounds of foundry copper—about 8% of their second quarter copper allotments.

V. Effect on critical areas

In hard-hit areas like metropolitan New York, where some 42,000 men in the construction trades had been totally or partially unemployed, a cheer went up as builders planned new starts or to finish stalled projects.

The three release orders of NPA had loosened up on 68 projects in that metropolitan area which had a dollar value of about $53 million. This gave the area some 13.5% of the total value of all projects released in the U. S. But in an area considered one of the most distressed in the country, some builders felt it too little.

Here are the projects over $2 million approved by NPA for the six hardship areas:

Los Angeles, hotel, by William R. Irwin, Beverly Hills, Calif., $8,350,-881; Washington, D. C., office building, by Jerry Maiatico, same city, $5,-805,000; retail store, Sears, Roebuck and Co., $2,700,000; San Francisco, parking garage, by city and county of San Francisco, $2,287,200; New York City, variety store, by Webb & Knapp, N. Y. C., $4,020,000, and shopping center, by Cross Properties, Inc., Yonkers, N. Y., $3,600,000.

SAVING "FREEDOM GATE" BRIDGE across the Imjin River in Korea is giving construction engineers a rough work-out. In the lower photo, a charge of TNT explodes, shattering an ice jam that threatens the span with destruction. (Wide World photo.)

Combat engineers fight to save bridge

The raging Imjin River in Korea (ENR Nov. 29, 1951, p. 28) is about to claim another bridge victim.

Less than a month ago, a new 1,350-ft rail and highway bridge across the treacherous river was opened for the possible return of allied prisoners of war from Red prison camps.

The span, known as the "Freedom Gate" bridge, was built by B and C companies of the 34th Engineers Construction Bn under command of Lt. Col. Leon Comerford, Jr., Washington, D. C. The bridge is being used daily by Allied personnel going to the armistice talks at Panmunjon.

Last week combat engineers began a desperate 'round-the-clock fight to keep the bridge from being broken up by ice floes. TNT charges were being used temporarily to break up the jam.

If the river destroys the bridge, it will be the ninth bridge casualty in this location since the beginning of the Korean campaign. The present structure replaced a pontoon bridge.

A special report to:

General Contractors

What the revised CMP Regulation 6 will mean to you—

New construction rules issued last week by the National Production Authority are an improvement over the old.

The improvement shows up mainly in better organization of the reading matter. Neither revised CMP Regulation 6 nor the new M-100 Housing Order changes the basic ground rules. You follow the same system as before in self-authorizing a small job or filing a CMP-4C application for a large one.

It is only in details that the two documents make things easier. In general, restrictions are loosened a little. But a few are tightened.

Both regulations open the door to free use of foreign and salvage steel—under certain provisos. With the single exception of recreational projects, you may buy and erect all the foreign and used steel you can get your hands on, provided:

(1) Your job won't then require more copper or aluminum than you receive in allotments for the project.

(2) If the job is small, it won't take more of these two materials than you are permitted to self-authorize—under the rules for your particular category of construction.

General contractors

If you had a small project under construction before the new rules took effect March 6, you may use the self-authorization ceilings that give you the greater benefit. In other words, if the new limitations are tighter than the old, you can continue to follow the older, more liberal rules. And, where the new ceilings are better for your project, you can adopt them.

Revised Regulation 6 allows you to self-authorize larger amounts of steel on two kinds of projects. For smaller commercial, school and other types of non-industrial, non-recreational construction, you may self-authorize up to 5 tons of carbon steel per project per quarter, including 2 tons of structural shapes but no wide-flange sections. The previous order permitted only 2 tons of steel, including all types of structural shapes.

Highway projects also get a higher ceiling for self-authorized steel orders. You may self-authorize up to 25 tons of carbon steel, including 2 tons of all types of structural shapes, for each highway project. This limit applies to the total steel for the job; it is not on a per-project, per-quarter basis.

Before you start a new small job that you consider eligible for self-authorization, however, you had better take a look at revised Regulation 6. That document puts three restrictions on self-authorized projects. You must be able to complete the job:

(1) Without exceeding the limits for controlled materials,

(2) Without requiring a DO rating for purchase of prohibited products such as metalworking machines or construction equipment, and

(3) Without using your DO rating for purchases in excess of specified dollar limits.

On this last point, you may not use a self-authorized DO rating to buy more for a single industrial plant or factory project than $100,000 of building equipment and materials (other than controlled materials) and $200,000 of production machinery and equipment. For all other small construction projects, the limits are $15,000 of building materials and equipment and $5,000 of production machinery. You are free to buy whatever you can get of these non-prohibited items without using a DO rating.

• **Owner authority**—Revised Regulation 6 makes it abundantly clear that all CMP authority on a project rests with the owner. For a small job, only the owner is given explicit right to self-authorize controlled materials orders and DO-rated orders.

Similarly, for a large project, the owner alone has authority to file a CMP-4C application, but he may delegate this authority to his prime contractor, engineer or other agent. If you are acting as agent for the owner, you must submit written proof of your authority with the application.

But the owner cannot transfer his allotments. Only the claimant agency can do that, as the rules explicitly state. Thus if you, as the owner of a property, sell a building that is under construction, you cannot transfer your controlled materials allotments to the buyer. He must re-apply to the claimant agency.

• **Recreation out**—No self-authorizing of purchase orders is permitted for familiar Table I. But you may start or continue construction of such a project without applying for NPA approval provided the job requires no more than 2 tons of carbon steel (including structural shapes but no wide-flange sections) and 200 lb of copper—or 100 lb of aluminum if the lighter metal is used instead of copper for electrical conductor.

Aluminum may be used in this way as an alternate for copper conductor on any project covered by Regulation 6, in the ratio of 1 lb of aluminum for 2 lb of copper. (Substitution of aluminum in the same ratio is permissible under the housing order.)

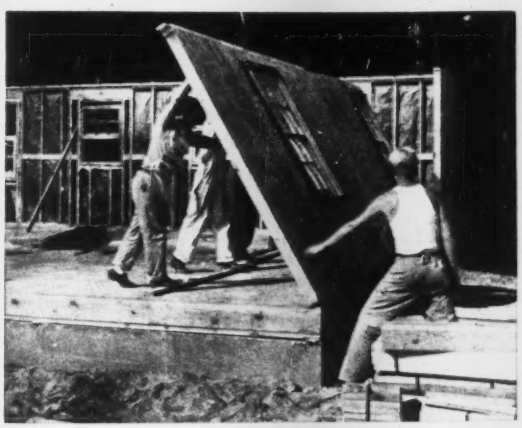
Revised Regulation 6 applies generally to all categories of construction except residential, oil, gas, electric power and communications facilities. Utility construction remains under existing orders: M-46B for oil and gas, M-50 for electric power and M-77 for communications.

NPA expects soon to issue another utilities order covering water resources, principally water supply and sewage

A special report to:

Home Builders

What the newly issued M-100 housing order will mean to you—



facilities. For the present, water resources projects remain under revised Regulation 6.

• **Approval needed**—Purchases of new metalworking machines require separate approval under the revised regulation. If you are building a factory that includes new metalworking tools in its production equipment, you must apply to NPA for a DO-Z3 rating to use on orders for these machines.

You cannot order new machine tools with the DO-U4 rating that suffices for other equipment and materials. Outstanding DO-U4 orders for metalworking machines that will be delivered after April 15 must be revalidated and converted to the DO-Z3 rating.

Home builders

Housing restrictions shifted to a new and practical basis last week with the issuance of order M-100.

Following industry suggestions, the Housing and Home Finance Agency and NPA brought out a set of rules that homebuilders can follow in stretching critical materials to cover 800,000 or more new starts this year.

Basically, the biggest change in the new order sets a limit on use of controlled materials in self-authorized houses. In M-100, quantity limitations apply equally to self-authorizing of purchase orders and to use of controlled materials in the structure.

Heretofore a homebuilder could dip into his pre-CMP inventory to supplement the self-authorized materials going into a house, now the use of controlled materials is definitely limited, whether the materials are taken out of long-standing inventory or acquired by self-authorized purchase orders.

This means that you cannot start a house requiring controlled materials in excess of the limitations without first getting an approval from HHFA.

As before, the self-authorizing procedure applies only to houses containing from one to four family units. M-100 as finally issued puts the self-authorizing limitations entirely in terms of quantities of controlled materials. Restrictions on floor area and number of bathrooms were dropped along the way. Also discarded was a formula for self-authorizing steel and copper on a graduated scale (ENR Feb. 21, p. 25).

• **Easing seen**—By comparison with the old regulation, M-100 eases the restrictions on use of steel and tightens the restrictions on use of copper. However, the limitation on copper for wiring is not reduced, and special provision is made for areas where local building codes require copper tubing for underground water service connections. Also, the new order allows an additional 15 lb of copper per dwelling unit for houses with electrical energy heating systems.

Here are the limitations within which you may self-authorize and use controlled materials in single-family to four family houses:

1. If the house is to be equipped with a steel pipe water distribution system, you may use up to 2,300 lb of steel and 35 lb of copper per dwelling unit. Where local building codes require Type B and K copper tubing underground, these limits change to 2,135 lb of steel and 80 lb of copper.

2. For a house with a copper pipe water system, up to 1,950 lb of steel and 135 lb of copper may be used. Where Type B or K copper tubing is required underground, this copper limitation is raised to 145 lb.

3. For alterations and additions to existing houses, you may self-authorize up to 50% of the amounts of controlled materials allowed above, per dwelling unit. But here too you are allowed extra materials for certain requirements. Thus, if you are wiring a house that has never been wired before, you may use up to 17½ lb additional of copper. And, if you are installing the first plumbing system that a house has ever had, you may self-authorize an additional 250 lb of steel where steel water pipes are used or 125 lb of steel and 50 lb of copper where the water system uses copper tubing.

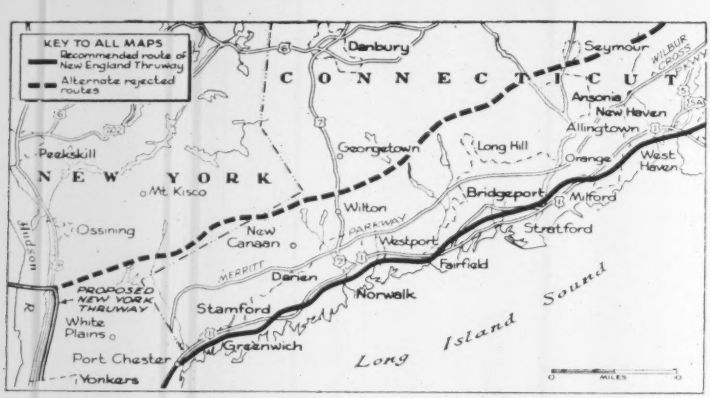
These quantities apply, of course, to alterations and additions that don't create any new family dwelling units. Where additional units are created, you may self-authorize the same quantities as are allowed for building new houses.

• **Restriction**—Like the previous order, M-100 bars the self-authorizing of any structural steel under the carbon steel allowance. But it permits you to buy and install all the foreign and used steel you want—including beams, angles and other structural shapes—provided you can still keep your project within the copper allowance.

M-100 lifts the ban on aluminum just a trifle. Looking forward to the day when you may be able to get aluminum conductor more readily than copper wire, the new order allows you to substitute the lighter metal in the proportion of 1 lb of aluminum for 2 lb of copper.

Houses containing more than four units have to be authorized under revised CMP Regulation 6, in the same way as before. If you want to start an apartment house, you should file a CMP-4C application. Address your communications to the nearest field office—of the Federal Housing Administration for public projects.

Exceptions on private single-family to four-family houses will continue to be handled by the Defense Liaison Staff, HHFA, Washington 25, D.C.



Report favors coast route for thruway

The proposed $111.7-million New England Thruway will run close to the shoreline if the report of a Chicago engineering firm is adopted by Connecticut.

Previous plans showed the highway running through sparsely settled country about eight mi inland. This route was called the Yankee Highway.

H. W. Lochner & Co., the engineers, stressed four advantages of the shore route.

- Elimination of Boston Post Road congestion.
- Accommodation of anticipated traffic loads estimated for the next twenty years.
- Availability for military and civil defense needs.
- Connection to the New York State highway system. This last refers to the Westchester county section of the New York State Thruway.

The engineers also criticized the inland route on the ground that it would not accomplish any of the four advantages of the shore route. The report even expressed doubt that the inland route would save money in construction, as had been claimed.

- **Financing**—The engineers suggested that the new highway be financed by a system of toll stations so placed that local traffic could move free of charge.

A financing plan which would have raised the state gasoline tax was rejected as unfair to residents who would be paying for a highway used by out-of-state drivers, too.

A special tax on commercial vehicles was rejected because of the reciprocity system existing between Connecticut and its neighboring states.

Many organizations in the state have expressed approval of the report and it is felt that the coastal route may be finally selected.

The recommended route has a total length of 43.7 mi. The report pointed out that the cost of the new highway had been estimated at $111.7 million. However, $3.2 million of this amount had been appropriated for a bypass highway in Darien leaving $108.5 million as the amount now needed.

Ohio turnpike gets steel

With assurance of a federal allocation of steel for the last quarter of the current year, the Ohio Turnpike Commission hopes to start actual construction in October on its projected toll superhighway. The road is scheduled for 80% completion by the end of 1953.

Commerce Secretary Charles Sawyer advised Gov. Lausche that Ohio could proceed with its turnpike plans, including the issuance of bonds, acquisition of land and the start of construction.

Estimates are that approximately 25,000 tons of steel will be required for the first quarter operations on the 182-mi stretch of the projected toll highway from the Pennsylvania state line to Maumee, south of Toledo. Approval of the project by the National Production Authority will assure the balance of 125,000 tons needed will be available during construction.

- **Other highway activities**—A special committee has been appointed by Gov. Beardsley to study the feasibility of toll roads in Iowa . . . A major job in the construction of the new Chesapeake Bay Bridge—drawing the cables—was finished and the last of the 122 suspension-span cables were stretched between the east and west anchor piers, recently . . . Detailed engineering studies of the proposed Baltimore, Md., inner harbor tunnel and connections are being made by Dr. Walter Yewell of the Engineering School at Johns Hopkins University. The tunnel is expected to be a four-lane mile-long structure.

- **Progress report on superhighway**—Full speed ahead has been ordered on the $20-million Detroit-Toledo superhighway in Michigan. State has taken options on 30 parcels of land for the right-of-way and should owners protest prices, condemnation proceedings will be rushed through at once. The urgency is due to the heavy use now being made of Telegraph road.

Arkansas highway group issues report of probe

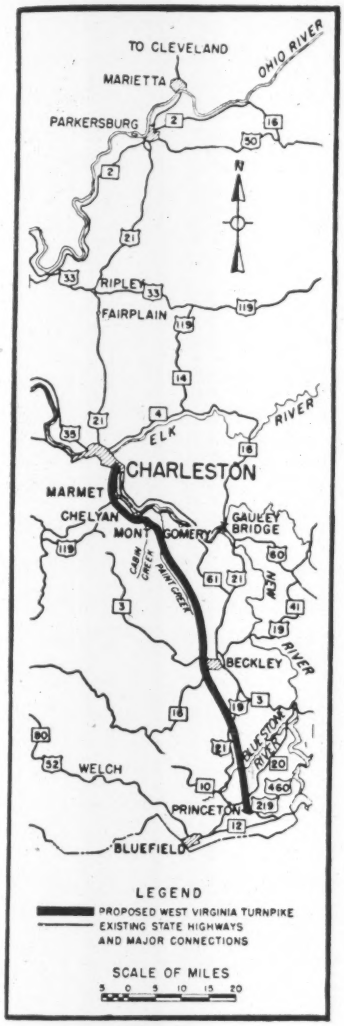
The Arkansas Highway Audit Commission has issued a 40-page "interpretation" of its findings in the state highway department (ENR Feb. 21 p. 26), charging bluntly that the department has been operated "inefficiently, extravagantly and with great waste of highway revenues."

Still to come from the HAC are the auditor's report, the engineers' report and recommendations for new legislation to the 1953 legislature. However, HAC recommendations for changes within existing laws included:

- **Recommendations**—Select highway employes on basis of ability. Eliminate excess employes and pay higher salaries to those remaining. Base all purchases on competitive bids. The attorney general should investigate all department purchases of the past two years to determine the amount of recoveries which might be obtained between low bids and amounts paid. State force construction should be reduced to a bare minimum or eliminated. Maintenance of highways should be on a route or sectional basis regardless of political or county boundaries. The highway directors responsibility should be assigned to the Highway Commission, not the governor. The Revenue Department should have a more vigorous program to enforce the size and weight limits of trucks.

All five members of the HAC signed the report.

- **Purchasing**—The report pointed out that purchasing as practiced in the highway department in the past "can lead only to highway bankruptcy." It said of stockpiling in 1950—"We consider it unfortunate that the state invested over $350,000 in materials not then needed, but we take a far greater alarm in a situation where the Highway Department can expend so large a sum without any decision by a responsible commission or official and apparently as a matter of informal discussion."



Steel to be allotted to mountain turnpike

The Bureau of Public Roads has strongly indicated that steel will be available for construction of the West Virginia Turnpike. Public Roads Commissioner Thomas H. MacDonald told A. B. Koontz, attorney for the West Virginia Turnpike Commission, that the steel has been requested from the National Production Authority.

The West Virginia highway will open up a new chapter in highway pioneering—both in plans and construction.

Details of the proposed 88-mi superhighway from Princeton to Charleston show techniques that will be used to conquer the rugged West Virginia mountains which will make it a wide departure from other turnpikes.

Estimates of financial feasibility are based on traffic estimates that almost 40% of the vehicles which will use the highway will be truck and commercial vehicles rather than passenger cars. By contrast, the number of these vehicles using the Pennsylvania, New Jersey, and Maine turnpikes are in the 10 to 15% bracket.

This large percentage of commercial traffic is expected to produce greater revenue per vehicle. Correspondingly a lower volume of traffic is necessary to make the project pay, the commission said.

Average daily traffic during the first year of operation is estimated to be 3,600. During the tenth year of operation, 8,600 a day is expected.

• **Comparison cited**—To carry this traffic, the commission has planned an expressway 24 ft wide, flanked by 9-ft paved shoulders on each side for passing purposes on long grades. By constructing a single width roadway, the commission has chopped the cost from $155 million, which a dual roadway would have cost, to $95 million.

This modification is supported, the commission says, by its traffic volume estimate of 8,600 vehicles daily during the tenth year. This compares with other turnpikes as follows:

Maine Turnpike, one of the two roadways of the dual highway, has carried 10,000 vehicles a day; New Jersey Turnpike has carried up to 13,000 vehicles per day on one of its dual roadways; Pennsylvania Turnpike has carried over 10,000 vehicles per day over one roadway of its dual highway—with seven two-lane tunnels.

The proposed West Virginia Turnpike is so routed that it will have a maximum ascending grade of 6%—and will include only one tunnel. This compares with a 3% maximum grade on the Pennsylvania Turnpike.

Turnpike pays own way

Although February is a low transportation month, receipts on the new Denver-Boulder turnpike in Colorado for the month indicate that the turnpike will be a paying proposition.

Daily receipts for the month averaged $890. Interest on the $6.3 million in bonds is $510 daily. All receipts above that amount are applied to the principal of the bonds.

The State Highway Department pays for the cost of maintaining the road and collecting tolls. The cost of this work is estimated at $210, and includes the salaries of eight tolltakers, a chief tolltaker, a bookkeeper and two maintenance men.

NEWS BRIEFS

• **Shelter**—New York's Gov. Thomas E. Dewey is asking the legislature to reappropriate $25 million for a state-wide bomb shelter program—and to ask Congress to pay one-half the cost.

• **Stop and start**—NPA changed its mind and permitted R. W. Construction Co. to continue building a $500,000 plant for Chain Belt Co., Milwaukee, Wis., which will be used to manufacture 155 mm "Long Tom" guns. Construction had been stopped by NPA after two warnings to the construction firm, because NPA said the Chicago ordnance district, U. S. Army, had not certified the construction as necessary.

• **Detroit airport planned**—A new $17-million east side airport for Detroit may be in the offing. The site picked by the Airport Commission is only 10 miles from the center of the city, and the project has the backing of Mayor Albert E. Cobo.

• **Scrap metal recovered**—Highway departments, contractors and equipment dealers in 37 states recovered 23,282 tons of ferrous scrap metal in January, according to a report by the Scrap Recovery Subcommittee of the American Association of State Highway Officials.

• **New Houston freeway**—Awarding of a $1-million contract marked the start of work on another Houston, Tex. superhighway project: a proposed six-lane freeway which will stretch from the Humble Highway in north Harris County into downtown Houston. Work just initiated will be on service roads. The proposed freeway will tie in with Houston's overall expressway system including the Gulf Freeway, Highway 75 and Highway 90.

• **Maryland building bonds**—The Maryland legislature authorized issuance of $23.5 million in bonds for various capital improvements. The measure includes $8 million for a new state office building in Baltimore and $3 million for a state office building in Annapolis.

• **Pollution control in Ohio**—Control and eventual abatement of pollution by effective use of the permit requirement is the major goal of the new Water Pollution Control Law of Ohio. The law, which goes into effect in September, applies to industries which discharge wastes directly into state waters.

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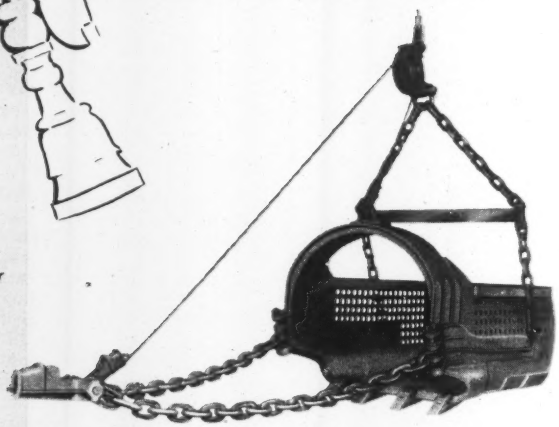

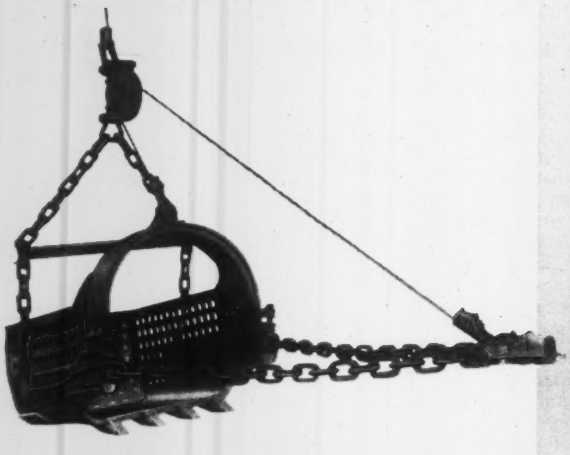

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ASCE meeting:

New Orleans railroad improvements slash slums, free city's traffic arteries

Last year New Orleans issued building permits at eight times the normal rate of $1 million a month. Since 1950 there have been 50 new additions to the city's skyline, the first in 20 years. In the same two year period 11 new industrial plants have been built in the metropolitan area with the result that there are 37,000 more people employed than at the peak of the World War II expansion.

These striking instances of municipal growth, revealed by Mayor de Lesseps S. Morrison at the opening session of the spring meeting of the American Society of Civil Engineers in New Orleans last week, however, were merely embroidery to a more basic and far-reaching development outlined in papers before the later technical sessions. This is New Orleans' great Union Railroad Terminal project by which (1) five old stations used by seven trunk line railroads will be replaced by a single modern structure and (2) a total of 116 of 144 existing grade crossings will be eliminated by the construction of 30 grade separation structures and the abandonment of the rest. In the process several hundred acres of slums will be eliminated, in the place of which several tall new apartment houses and a new hospital have already appeared. At the same time that this is going on, the city and the state highway department are building pieces of a belt expressway from Lake Pontchartrain on the north to the Mississippi River on the south, together with active studies for a great new highway bridge across the river right at the edge of the main business section.

There were some 60 technical papers on the program dealing with the whole broad field of civil engineering subjects but those focused on New Orleans and its modern transformation attracted major interest.

• **Good deal for railroads**—In recent years there has not been much enthusiasm for union passenger terminals on the part of the railroads because of the high cost involved. In New Orleans, however, the city will pay for the facilities and charge the railroads rent for their use. The agreement was described by C. J. Wallace, manager of the Union Passenger Terminal. Under it the city issued $15 million of tax free revenue bonds, the interest and amortization of which will be covered by the railroad rentals. These bonds also cover the railroads' 15% share of the grade crossing elimination costs. The railroads will also pay the maintenance and operation costs of the terminal pro-rated according to their use of the facilities.

The net result is that the railroads are on a pay-as-you-go basis in providing themselves with a modern terminal, and since they will go on paying rent after the terminal is paid for—in an amount equal to the ad valorem taxes—the city will have a revenue-producing facility that cost it nothing.

The terminal is divided into four parts or zones—station building, approach and station tracks, coach yard facilities, and engine overhaul facilities. The station building foundations are under way. It will be a two-story building with 94,000 sq ft of floor space. The station tracks and platforms are complete. It is planned that all of the facilities will be complete some time next year, with the exception of eight of the 30 grade separations. Some of these may require as much as five years additional.

To finance the remaining 85% portion of the grade separation costs, the part of the terminal board representing the city issued additional bonds to the amount of $23.5 million. This with the state and federal contributions applicable to street improvements will bring the total cost to the neighborhood of $50 million.

• **Novel overpass**—As indicative of the problems being met in building the grade separation structures, the one at North Galvez St. was described by Prof. Walter E. Blessey of Tulane University. New Orleans foundation conditions being about as bad as any in the country, continuous structures are not normally used. Nevertheless, at this site, by careful attention to pile driving, it was possible to incorporate 17 spans of continuous steel stringers and to utilize an all-welded

C. J. WALLACE, Union Passenger Terminal manager, describes New Orleans agreement. (Times-Picayune photo)

design, the first used in Louisiana.

New Orleans soils consist first of about 20 ft of organic clay and peat then 20 ft plastic clay, 10 ft of sandy silt, a 15 ft sand layer and then Pleistocene clay to a depth of about 150 ft. A great many structures have been founded on the upper plastic clay with consequent settlement. Even the Pleistocene clay compresses under large enough loads. Taking these facts into account, the North Galvez St. overpass was founded on piles driven about 55 ft to the sand layer, and the structure was made light enough so that the Pleistocene could carry the loads without compressing. The extreme settlement that could be expected had the structure been founded in the upper plastic clay is emphasized by the fact that the maximum height of fill that could be used in the approach to the structure was 3 ft.

Prof. Blessey pointed out that a saving of about 20% in structural steel tonnage was effected over simple beam construction by the use of continuity. Also by using welding instead of riveting an additional 7.3% saving was effected. Most of this latter saving was made in the stringer splices. Welded, they required one-fifth of a ton, whereas riveted splices would have used up 29 tons of hard-to-get steel.

• **Hospital that won't settle**—Not only the North Galvez St. overpass but the new veterans' hospital which will

(Continued on next page)

be ready for occupancy next month, demonstrates that engineers in New Orleans are learning how to cope with their bad soil conditions. Just as with the overpass, piles are stopped on the sand layer over the compressible clay, but because the building could not be lightened the foundation load was reduced by excavating a deep subbasement. Thus while the estimated gross weight of the building is 67,000 tons, a total of 36,700 tons of earth was removed for the basement, reducing the foundation load by about 50%. This is carried by 2,030 wooden piles from 80 to 90 ft long.

A maximum settlement of 8 in and a differential settlement of 5 in was allowed for, although the latter may be reduced to 3 in by using a 4-ft thick foundation slab joined to heavy concrete girder walls for the full 23 ft depth of the subbasement. Since this building is adjacent to the famous Charity Hospital which has settled 12 in, these results would be noteworthy. Actually, to date, the maximum settlement of the veterans' hospital has been only 2.6 in and the differential settlement 1.1 in, according to Herman A. Huesmann, chief of the foundations and materials branch, New Orleans district, Corps of Engineers, who included this description in a paper on foundation problems in the New Orleans area.

• **Did you know?**—The new bridge being built over Tampa Bay in Florida will include 3 miles of prestressed concrete construction represented by 2,178 precast beams of 48-ft span designed by Preload Corp. for and in cooperation with the consulting engineers, Parsons Brinckerhoff, Hall and Macdonald. The beams will be reinforced by three 1-in dia bars of special high carbon cold worked steel equipped with special threads and nuts. Called Macalloy bars they are part of the Lee-McCall prestressing system and come from England. The contractor is Hardaway Contracting Co. of Columbus, Ga. A paper on the job was given by Maurice N. Quade, one of the consulting engineers.

The new bridge over Bay St. Louis in Mississippi is just getting under way and will require the precasting of 182 deck sections, weighing 119 tons each. They will be moved to barges by a gantry crane, and transported to the pile bents where they will be lowered onto their shoes by filling barge compartments with water. Hydraulic jacks will effect the final positioning. Some 2,000 piles must also be precast by the contractor, Merritt-Chapman & Scott Corp. of New York. The bridge was designed by Hazelet and Erdal, of Louisville, and was described by Robert H. Wood of that firm.

The Morganza floodway structure which will take some 600,000 cfs out of the Mississippi River during floods, will be completed for the high water season of 1953. It consists of a concrete weir 3,900 ft long divided into 125 bays closed by gates. It carries both a highway and a railway. It is located just above Morgan City, La., and connects the Mississippi with the Atchafalaya River. It is a Corps of Engineers job.

The first real trial of an inter-agency river basin committee is under way in the Southwest. It is working on plans for the development of the Arkansas-White-Red River basins. All federal agencies as well as state and local interests are represented. The interagency committees operating in the Missouri and Columbia basins were established after major planning of the basin facilities had been finished, and so are not of the same kind. Planning work is under the chairmanship of the Corps of Engineers, and Col. L. W. Prentiss, division engineer at Dallas, and Lt Col. J. B. Lampert, the officer in charge of the work, described it in separate papers.

Costs have gone up on deep bridge foundations in an arresting manner. Louisiana has built a good many and Louis C. Duclos, head bridge designer of the state highway department, cited these comparative figures as between 1951 and 1927: Open excavation $3.70 vs $2; concrete in caissons, $60 vs $10; concrete above caisson, $50 vs $17.

What ASCE board did—

• Concurred in recommendation of exploratory group on unity in the profession that Plan A (ENR Feb. 21, p. 47) to bring all groups under Engineers Joint Council, be put into effect.

• Changed name of irrigation division to irrigation and drainage division.

• Voted to make a biennial study and report of engineering salaries, and to add teachers salaries to the study. The last report on salaries covered the year 1950.

• Asked Civil Service Commission to reconsider its recent ruling abolishing an engineer classification for surveyors and mappers.

• Joined with the Associated General Contractors in urging remedial legislation that will assure the right of court review of decisions of federal contracting officers.

• Supported the AGC in its opposition to the recent government practice of permitting bids on alternate designs. Took the stand that there can be no fair competition unless all bids are submitted on the same design.

• Appointed a new joint committee with the American Institute of Architects to function on problems common to the two professions in much the same manner as the existing joint ASCE-AGC committee now operates. ASCE members are Craig Hazelet, Louisville; Brooks Earnest, Cleveland; and Mason G. Lockwood, Houston.

DAVID W. GODAT, New Orleans consulting engineer, was general chairman of the ASCE meeting. His firm has designed several of the grade separation structures resulting from the rail terminal work.

Concrete pipe makers see big year ahead

Total production of all types of concrete pipe—including sewer, culvert, pressure, and farm drains—is estimated to reach 100 million tons this year. This would be equal to last year's production, said Howard Peckworth, managing director, American Concrete Pipe Association, at the association's 44th annual convention in Chicago, Feb. 28-Mar. 1.

Cement production should increase substantially during the next two years, according to D. G. Runner, chief of the cement and concrete section, Building Materials Division, National Production Authority. He told the four-day meeting that spot shortages of cement in California, Texas, Michigan, Ohio and Florida have been alleviated.

MEETINGS

Committee to initiate adequate road campaign

A group to be known as the "Project Adequate Roads Committee" or the "National PAR Committee" was organized in New York on Feb. 28 at a meeting of executives of 40 organizations representing automobile manufacturers, highway officials, motor-vehicle owners and bus and truck operators. Stated purpose of the organization is to arouse public action to get the country out of its present highway traffic muddle.

Heading the group as an operating committee are Paul B. Reinhold, president, Atlas Equipment Corp., and president of the American Road Builders Association; L. S. Wescoat, president of the Pure-Oil Co.; Albert Bradley, vice-president of General Motors and chairman of the National Highway Users Conference; and Arthur M. Hill of the Greyhound Corp. Mr. Hill is to serve as temporary chairman of the committee until its next meeting, which will be held in connection with the Fourth Highway Transportation Congress in Washington, May 6-8.

Arthur C. Butler, director of the National Highway Users Conference, was elected permanent secretary of the committee.

Mr. Bradley, in announcing the formation of the PAR Committee, said that its first concern will be to urge defense officials to recognize that highway improvements are just as essential to the nation's defense effort as "armament, power or other primary elements."

CALENDAR

Structural Conference, University of Texas, March 21-22.

American Power Conference, Sherman Hotel, Chicago, March 26-28.

Earthmoving Industry Conference, Pere Marquette Hotel, Peoria, Ill., April 9-10.

Concrete Reinforcing Steel Institute, The Greenbrier, White Sulphur Springs, W. Va., April 28-May 3.

American Water Works Association, Municipal Auditorium, Kansas City, Mo. May 4-9.

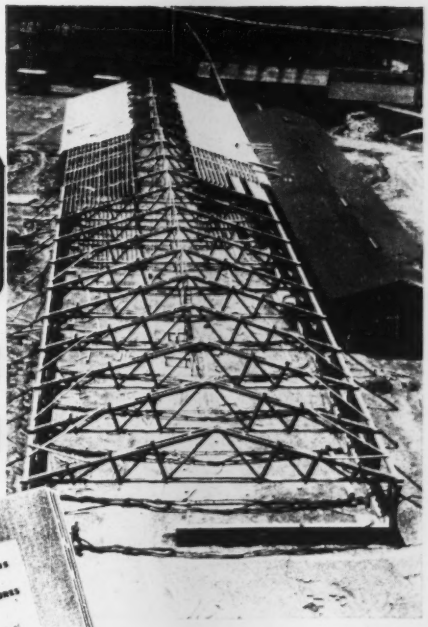
Highway Transportation Congress, Washington, D. C., May 6-8.

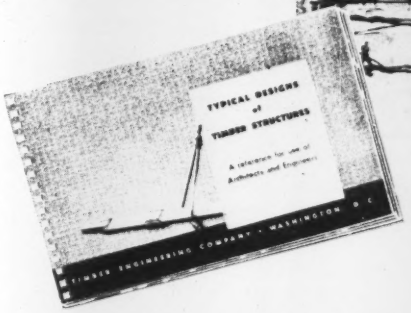
Industrial Wastes, Conference, Purdue Memorial Union, Lafayette, Ind., May 7-9.

First World Conference, International Road Federation, Washington, D. C., May 8.

Society for Experimental Stress Analysis, Hotel Lincoln, Indianapolis, Ind., May 14-16.

TECO TIMBER CONSTRUCTION





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ENR

Controls crackdown starts

The compliance division of the National Production Authority has shifted the emphasis of its policy from education to enforcement.

There are two reasons for this shift, as explained by John Peckham, director, compliance division, and Robert H. Winn, assistant general counsel:

1. If the manufacturers and fabricators of the country don't know about NPA and its regulations by now, they never will.

2. The compliance division staff is now large enough to handle an increasing number of cases.

With 300 investigators in the field and 20 lawyers preparing cases for litigation, compliance officials feel that they can now crack down on offenders. The earlier policy was to warn and educate before trying to enforce. Such a policy was necessary, compliance men point out, because the country was unfamiliar with NPA and its regulations.

• **Changing situation**—Most of the offenders in those days were guilty only because of ignorance. All NPA had to do was explain how its regulations were being broken, and most people then would stop their illegal operations. But the situation is different now. The illicit operators active today are trying to make a fast profit, some of them will try anything; these men would laugh at anymore who asked them to stop a profitable operation simply because it was illegal or against the general welfare of the nation. These are the men that the compliance division is going to sit on—hard.

But on the whole, enforcement officials say, there has been willing cooperation from industry and the public.

People remember the old WPB and know how to live with bureaucratic agencies that have the responsibility of governing the economy. Civic officials have given their cooperation, and the general public has been willing to help.

• **Civic co-operation**—An example of civic cooperation can be found in the action of building inspectors around the country. They have withheld building permits until NPA authorization was forthcoming, and some cities have stamped all construction correspondence with notices warning about NPA regulations.

Compliance officials point to the contrast between the past and the future as proof of the changed emphasis in policy.

Since active field operations were started in May, 1951, NPA has taken action in 15 cases—nine suspension orders and six criminal cases. In the calendar year of 1952, NPA expects to initiate 150 cases of litigation.

NPA enforcement officials have three weapons at their disposal when dealing with offenders:

1. The suspension order—which is used to remedy dislocations in the nation's supply line.

2. The injunction—which is used to halt the use of controlled materials in an improper way or by an improper user.

3. The criminal charge—which, up to now, has been used against the black marketeer.

A suspension order is issued when a company has used too much con-

(Continued on page 36)

JOHN PECKHAM, director of NPA's compliance division, heads agency's crackdown on controls violators.

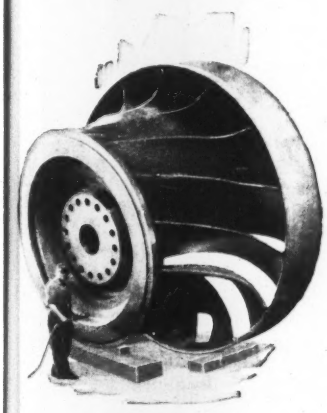
ENGINEERING CONSTRUCTION CONTRACTS REPORTED TO ENGINEERING NEWS-RECORD—FEBRUARY, 1952

ENGINEERING NEWS-RECORD reports continental U.S. construction projects of the following minimum costs—Waterworks, excavation, drainage and irrigation, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000

Four Weeks—Thousands of Dollars (000 Omitted)

	February, 1952							—U. S. Cumulative—		%	
	New England	Middle Atlantic	South	Mid-West	West of Mississippi	Far West	Total U. S.	Two Months 1952 (9 Weeks)	1951 (8 Weeks)	Change '51 to '52 Avg. Week	Canada February 1952
Public Works											
Waterworks	158	3,605	1,529	7,084	3,811	2,664	18,851	45,389	30,121	+34	3,790
Sewerage	1,376	2,762	1,599	2,647	5,077	2,070	15,531	32,485	52,992	−46	439
Bridges	581	6,435	2,447	3,592	2,376	5,837	21,268	39,587	44,473	−21	1,906
Earthwork and waterways		541	2,725	323	5,464	9,294	18,347	65,220	40,598	+43	
Streets and roads	3,222	3,835	14,325	7,372	17,201	12,435	58,390	165,722	132,204	+11	1,084
Public buildings, residential	2,198	7,681	21,649		8,942	14,372	57,842	131,644	133,772	−13	456
Other public buildings	1,139	26,393	31,186	4,733	16,523	32,856	116,130	253,613	418,462	−46	7,146
Unclassified	3,532	2,203	26,570	8,265	17,951	9,152	67,673	114,031	70,110	+45	3,073
Total public	15,206	53,755	105,030	34,016	77,345	88,680	374,032	847,691	922,732	−18	17,894
Federal government (included in above classifications)	3,853	21,327	41,402	8,752	31,092	45,355	151,691	306,619	355,663	−23	8,997
Private											
Bridges		60			780		840	840	2,109	−65	
Industrial buildings	1,800	11,346	19,484	38,711	79,319	7,800	158,460	495,877	1,026,361	−57	18,958
Comm'l buildings, residential	3,795	96,906	32,816	18,850	25,889	6,467	184,723	447,163	361,604	+10	9,744
Other commercial buildings	2,810	16,889	6,430	3,600	5,115	2,138	36,982	69,223	118,228	−48	3,250
Unclassified			5,674	2,155	21,563	4,000	33,392	124,433	106,923	+ 3	100
Total private	8,405	125,201	64,404	63,316	132,666	20,405	414,397	1,137,536	1,615,225	−37	32,052
Total Engineering Construction:											
February, 1952 4 weeks	23,611	178,956	169,434	97,332	210,011	109,085	788,429				49,946
January, 1952 5 weeks	33,440	187,855	355,399	217,856	316,154	86,094	1,196,798				158,763
February, 1951 4 weeks	30,642	413,793	168,673	183,230	320,485	154,242	1,271,065				72,128
Two Months 1952	57,051	366,811	524,833	315,188	526,165	195,179		1,985,227		−30	208,709
Two Months 1951	63,065	589,572	589,253	449,979	572,331	273,757			2,537,957		195,114
% Change '51 to '52	−20	−45	−21	−38	−18	−37					−5

HARNESSING WATER-
A Source of Natural Energy-



SURGING, irresistible water . . . Sweeping through rapids and roaring over the cataract's crest . . . An inextinguishable source of power—tamed and subjugated in the service of man!

Nothing in the mythical accomplishments of the alchemist of old, who by sorcery changed lead into gold, surpasses in magic the conversion of the power of falling water into electrical energy by Smith-made water power machinery.

More than 75 years, devoted exclusively to the building of hydraulic equipment — including turbines alone of more than 13,000,000 horsepower capacity—are your assurance of maximum power results, when you place your problem in our hands!

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Make Costly Manhours More Productive

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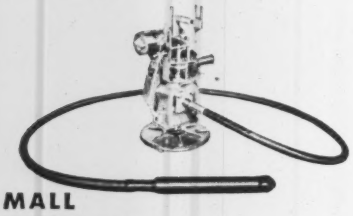
PORTABLE

POWER TOOLS

Capitalize the manhours you pay for by getting a bigger pay-off in terms of *more productive labor* . . . with the help of smooth-working, time- and labor-saving Mall Power Tools. Less sweat, less muscle, less end-of-the shift fatigue but more work done — all this adds up to keeping the job on schedule and netting a better return on your contract when Mall Power Tools take over the hard work. Men like the "feel" of these husky, dependable tools and the contractor likes the low-cost maintenance and high scoring heavy-duty service — backed by over 30 years' experience in tool design, production and field testing.



MALL VIBRATORS

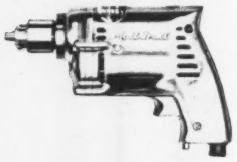
Mall concrete vibrators produce better finished concrete at minimum cost because less water, less cement and coarser aggregate are needed . . . for concrete free from honeycombing. Pneumatic, electric or gasoline engine models, equipped with heavy-duty Mall Flexible Shafts.

Write for Bulletin 2022.

MALL DRILLS

Mall Drills have perfect balance, are built for years of service drilling any material. A model and size for every condition. Pneumatic or electric power. Capacities ¼" to 1¼".

Write for Bulletin 2073.



MALL CHAIN SAWS

Here's dependable cutting power for woods or construction jobs . . . handles hard, soft, wet, dry or frozen wood. Available in pneumatic, electric or gasoline engine types, ranging from 12" up to 144" capacity. One and two-man models.

Write for Bulletin 2066.

Write for bulletins listed above for complete details regarding equipment in which interested.

40 Factory-Owned Service Warehouses, Coast To Coast, To Serve Our Customers and Thousands of Dealers

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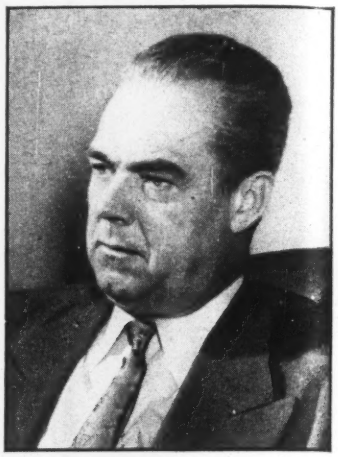
Construction Business . . .



ROBERT H. WINN, assistant general counsel, helped change the policy from education to enforcement.

trolled material, or when a company has used controlled material that it had no right to use. This proceeding is not primarily punitive, although it has that practical effect.

Primarily, the suspension order is an executive procedure to allow the nation's distributive system to close a gap caused by improper use of scarce materials. When one company uses more material than it deserves, another company receives less than it should. Until this gap is made up the nation as a whole suffers.

• **Go to Court**—The injunction is resorted to when a company is using controlled materials and refuses to stop operations after being warned. This process is ordinarily used in conjunction with either the suspension order or a criminal charge.

The injunction is issued by a court upon evidence offered by regional compliance offices; if the offending company refuses to halt its operations, it is in contempt of court.

The criminal charge is the most severe weapon at the disposal of the enforcement officials. Although this weapon has so far been used only on black marketeers, NPA men think that it may be used more often in the future.

NPA policy in the use of the criminal charge is to demand a jail sentence. The enforcement people will not accept a fine. This is the only weapon that needs a wilful violation before it can be used. The injunction and the suspension order can be used against any offender whether wilful or not.

(*Continued on next page*)

Construction Business . . .

The bright spot for the construction industry, however, is the fact that up until the first of March, NPA had taken only two actions against the industry or its fabricators. One of these actions was against Alside Inc., of Akron, Ohio, charged with using unauthorized material for fabrication of aluminum siding.

The other action was taken against the Delaware Ave. Holding Corp., of Columbus, Ohio, charged with unauthorized use of structural steel beams in the construction of an office and warehouse building.

NPA issued a suspension order against Alside for six months, from December 1, 1951, to June 1, 1952. The Delaware Ave. Holding Corp. was suspended for three months, from October 15, 1951, to January 15, 1952.

There are a number of reasons for the general honesty of the construction industry in observing NPA regulations, enforcement officials point out. For one thing, the industry is so competitive that each contractor keeps an extremely close watch on all other contractors in his neighborhood. With this type of self-policing, there is little chance for anyone to get away with a violation.

Another reason given is the long memory contractors have. When Korea started, every contractor in the country began preparing for a construction order. They remembered World War II, and they had a fairly good idea of what would happen.

A third strong point was the honesty of civic authorities. If a contractor couldn't get a building permit unless he had NPA authorization, he certainly couldn't use his materials improperly. Enforcement men praise civic authorities throughout the country. Without their help, they doubt if the small investigative staff in the compliance division would have been able to police the industry.

Enforcement men point to a theatre in Washington, D. C. as an example of the construction industry's foresight and watchfulness. The theatre was built during the fourth quarter of '51, when all recreational building was prohibited. Twenty-four hours after the contractor started tearing down a store on the site, complaints started pouring over the compliance director's desk.

An investigation was started, but it ended five minutes after the investigator reached the job. Leading the investigator behind the store, the contractor pointed to footings that had been placed five months before order M-4 came out.

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LAYS PIPE

Tops for water, gas, sewer, telephone and power lines — leak clamp openings — highway and airport drainage . . .

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- More maneuverable — fewer traffic hazards — better public relations.

Filling—tamping—traveling simultaneously.

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- especially desirable boiler rooms and all dry areas

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Construction Business . . .

Costs creep up slowly

ENGINEERING NEWS-RECORD's construction and building cost indexes for March show that materials prices and wages, while relatively stable, are continuing their slow, upward movement.

Construction costs at 550.60 are up 0.2% from February, and are 2.1% above March a year ago. Building costs at 407.21 are up 0.3% from last month and 1.9% from last year.

The expected rise in steel prices has not come through to date. Cement is up 0.09% from last month and 1% above last year.

Lumber prices show a stiffening tendency although they are up only 0.3% since last month. They are still 2.4% below last year's prices.

At the start of the season when most labor contracts are written, common wages are up 0.3% for the month, and 4.3% for the year. Skilled wages are up 1% since February, 5.7% since March, 1951.

• **ENR's 21 cities fairly steady**—There were few important changes between February and March in ENGINEERING NEWS-RECORD's 21-cities building and construction cost indexes.

The material cost component advanced in six cities, due principally to slight lumber increases. Material price components were up as follows: Birmingham, up from 186.21 to 187.30; Boston, up from 225.45 to 226.54; Detroit, up from 221.05 to 221.17; Los Angeles, up from 212.95 to 215.12; Philadelphia, up from 250.38 to 251.10; and San Francisco, up from 189.46 to 191.64.

For one city, Baltimore, the materials cost component was down, from 212.29 to 212.02. The slight decline was traced to a change in lumber price.

• **Labor costs**—The component for common labor showed only one change. In Philadelphia, the component was up from 1.66 to 1.75. Three cities reported increases in skilled labor costs—Birmingham, up from 2.432 to 2.458; Kansas City, up from 2.585 to 2.798; and St. Louis, up from 2.846 to 2.863. **(For the full 21-cities listing of building and construction costs, see accompanying table.)**

Firm guarantees plywood prices for six months

One of the nation's largest producers of plywood, the U. S. Plywood Co., has guaranteed not to increase its current Douglas fir carload prices for the next six months.

The action was taken to help contractors bidding on government and other contracts requiring deferred deliveries, the company said. "Recent gyrations" in price had made it diffi-

(*Continued on page 41*)

MARCH COST INDEXES

ENR 21-Cities Building Cost Index
1913 = 100

City	1952 Mar	1952 Feb	1951 Mar
Atlanta	351	351	339
Baltimore	410	410	398
Birmingham	355	353	351
Boston	411	410	404
Chicago	415	415	401
Cincinnati	400	400	400
Cleveland	403	403	402
Dallas	371	371	362
Denver	431	431	426
Detroit	416	416	402
Kansas City	431	417	406
Los Angeles	394	392	403
Minneapolis	438	438	412
Montreal	383	383	363
New Orleans	379	379	379
New York	460	460	466
Philadelphia	462	461	449
Pittsburgh	416	416	400
St. Louis	429	427	432
San Francisco	383	381	375
Seattle	389	389	384

ENR 21-Cities Construction Cost Index
1913 = 100

City	1952 Mar	1952 Feb	1951 Mar
Atlanta	395	395	395
Baltimore	510	510	486
Birmingham	417	416	416
Boston	590	588	576
Chicago	626	626	603
Cincinnati	547	547	559
Cleveland	625	625	607
Dallas	437	437	437
Denver	571	571	552
Detroit	621	621	592
Kansas City	586	586	570
Los Angeles	565	563	580
Minneapolis	593	593	557
Montreal	500	500	445
New Orleans	435	435	441
New York	612	612	618
Philadelphia	601	582	575
Pittsburgh	557	557	531
St. Louis	587	587	585
San Francisco	532	529	518
Seattle	606	606	586

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Compare the list price of a Chevrolet truck with that of any other truck built to handle the same payloads. You'll find the Chevrolet truck lists for less, yet brings you ruggedness, stamina and great truck features you won't find in many trucks costing much more.

FACT No. 2

ROCK-BOTTOM OPERATING COSTS

Dollar-for-dollar comparisons prove that Chevrolet trucks cost least to own and maintain. Valve-in-Head economy saves on gas, in the 105-h.p. Loadmaster or 92-h.p. Thriftmaster engines. Four-way engine lubrication reduces wear and oil costs. Rugged construction means long life.

FACT No. 3

ENGINEERED FOR YOUR LOADS

Every Chevrolet truck is *factory-matched* to payload and service requirements. You don't have to buy more truck—or settle for less truck—than you need for your loads. Frame, axles, springs, body, brakes and power are balanced for the job.

FACT No. 4

LOWER, SLOWER DEPRECIATION

Records show that Chevrolet trucks traditionally bring more money at resale or trade-in than many other makes. Chevrolet's market value stays up because the value stays *in!* Here is important and convincing proof that Chevrolet is the best truck buy!

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—the 105-h.p. Loadmaster or the 92-h.p. Thriftmaster—to give you greater power per gallon, lower cost per load • POWER-JET CARBURETOR—for smooth, quick acceleration response • DIAPHRAGM SPRING CLUTCH—for easy-action engagement • SYNCHRO-MESH TRANSMISSION—for fast, smooth shifting • HYPOID REAR AXLE—for dependability and long life • TORQUE-ACTION BRAKES—on light-duty models • PROVED DEPENDABLE DOUBLE-ARTICULATED BRAKES—on medium-duty models • TWIN-ACTION REAR BRAKES—on heavy-duty models • DUAL-SHOE PARKING BRAKE—for greater holding ability on heavy-duty models • CAB SEAT—with double-deck springs for complete riding comfort • VENTI-PANES—for improved cab ventilation • WIDE-BASE WHEELS—for increased tire mileage • BALL-TYPE STEERING—for easier handling • UNIT-DESIGNED BODIES—for greater load protection • ADVANCE-DESIGN STYLING—for increased comfort and modern appearance.

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...as much as 65% to 80%
BY
CHAPMAN
Tilting Disc CHECK VALVES

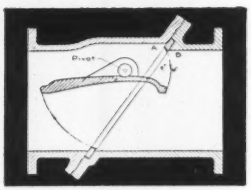
Typical test on a 22-inch Chapman Tilting Disc Check Valve under 450 pounds gas pressure . . . carrying 3,200,000 feet of gas per hour . . . showed a drop in pressure of less than 7 inches of water.

The average reduction of head loss . . . as against conventional check valves . . . is 65% to 80%.

That's because the balanced hinge-pinned disc, of special aerofoil design, has exceptional lifting qualities, lightness in unbalanced weight, and minimum resistance to flow in open position. And valve body is streamlined, with through-way always equal to the area of the pipe.

This means that *disc won't slam* under usual piping arrangements ...and that it seats drop-tight. It means, too, that many new lines can be designed in smaller size. Send for Catalog No. 30, giving complete data and test-curves on Chapman Tilting Disc Check Valves.

THE CHAPMAN VALVE MFG. CO.
INDIAN ORCHARD, MASSACHUSETTS



Cross-section of the Chapman Tilting-Disc Check Valve illustrating the way that the balanced disc is supported on the pivot, with arrows showing the travel of the disc. A feature of the design is that the disc seat lifts away from the body seat when opening, and drops into contact when closing, with no sliding or wearing of the seats.

Construction Business . . .

cult for contractors and fabricators using fir plywood to establish definite costs on end products.

• **Upward price trend**—The "gyrations" referred to have been up since Jan. 1, according to Engineering News-Record's 21-cities price reports.

For example, the price of ⅜th inch plywood on Jan. 1 of this year was $152 per M sq ft. It was up to $167 on Feb. 1, and up again to $176 on Mar. 1, reflecting an increase of $24 per M sq ft in two months.

This is still below the price of $204 per M sq ft which prevailed during the first 11 months of 1951.

• **Higher than 1950**—But current prices are higher than those quoted in the first six months of 1950. On Jan 1, 1950, ⅜th inch plywood was priced at $145 per M sq ft. It advanced to $150 on Feb. 1, and was up to $163 on April 1. That price held until July 1, 1950, when it advanced to $177.

Prices continued to rise until November, 1951, when the price on ⅜th inch plywood dropped from $204 per M sq ft to $172, as the government reduced the volume of its plywood purchases and demand sagged.

By Jan. 1 of this year, the price was down to $152. Then the market picked up. Demand improved and orders outstripped production for several weeks. Prices began to climb to higher levels, and had picked up $24 per M sq ft in two months.

Prices on ¾ inch plywood closely paralleled the pattern for ⅜th inch during the same period.

Construction machinery shipments increase 36%

Fourth quarter shipments of excavating and earth-moving equipment, including tractors, were valued at $215 million, according to the Census Bureau. This was 36% higher than third quarter, 1951, shipments which were valued at $159 million.

Shipments of power cranes and shovels were up 15%; road construction and maintenance machinery, up 29%; construction machinery for mounting on tractors, up 39%; and tracklaying tractors, up 59%, during the fourth quarter.

• **1951 total up**—Every major category showed an increase during 1951. Excavating and earthmoving equipment shipments in 1951 were valued at $765 million, 36% above 1950. Power cranes and shovels were up 66%, rising from $109 million in 1950 to $181 million last year. Shipments of road construction and maintenance machinery were valued at $65 million in 1951. This was 10% above the 1950 total.

The value of shipments of tracklaying tractors was $264 million last year, 18% above the $223 million reported for 1950.

Equipment prices up 44% since January, 1947

January, 1952 prices of construction equipment average 124.6 based on 1947-49 = 100. This is an increase of 44% since January, 1947.

This was shown by a new price index just released by the Bureau of Labor Statistics as a sub-series within the new "Machinery and Motive Products" grouping of commodities in the new wholesale price index.

The construction machinery subgroup prices 44 machines monthly. No construction machinery prices were used in the former wholesale price index.

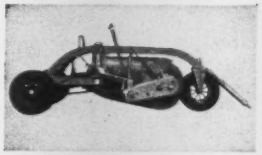
BLS estimates that $1 billion worth of construction equipment is represented in this new monthly price trend series. (For price trends in specific categories, see table below.)

New Wholesale Price Index—Construction Machinery and Equipment

Primary market prices by Bureau of Labor statistics
1947–49 = 100

	Jan 1947	Dec 1947	Dec 1948	Dec 1949	Dec 1950	Dec 1951	Jan 1952
Construction							
Machinery & Equipment	86.3	94.7	108.7	108.1	121.7	124.0	124.6
Power cranes	87.7	94.2	108.6	106.8	121.4	123.6	123.6
Machy., tractor — mtd.	83.2	93.6	108.9	109.7	121.7	123.0	127.5
Specialized machinery	84.2	99.8	106.5	105.8	118.2	119.5	119.5
Port. air comp	93.6	93.6	105.4	105.4	122.9	124.8	124.8
Scrapers & graders	85.9	95.4	110.4	108.4	123.8	128.4	128.6
Air tools, hand held	89.6	97.5	106.0	106.0	115.9	120.5	120.5
Mixers, pavers	89.3	94.7	105.5	107.7	117.3	118.5	118.5
Tractors (non-farm)	84.1	93.8	110.1	110.3	123.7	125.8	126.6

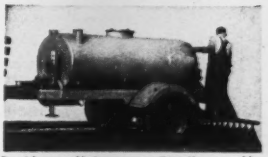
GRACE
Asphalt and Compaction Equipment



3 sweeper models, axle, engine or tractor powered.

Chip spreaders 8' to 12' width. Also asphaltic concrete spreaders.

Rapid Fire circulating heaters heat and unload large tanks of asphalt.

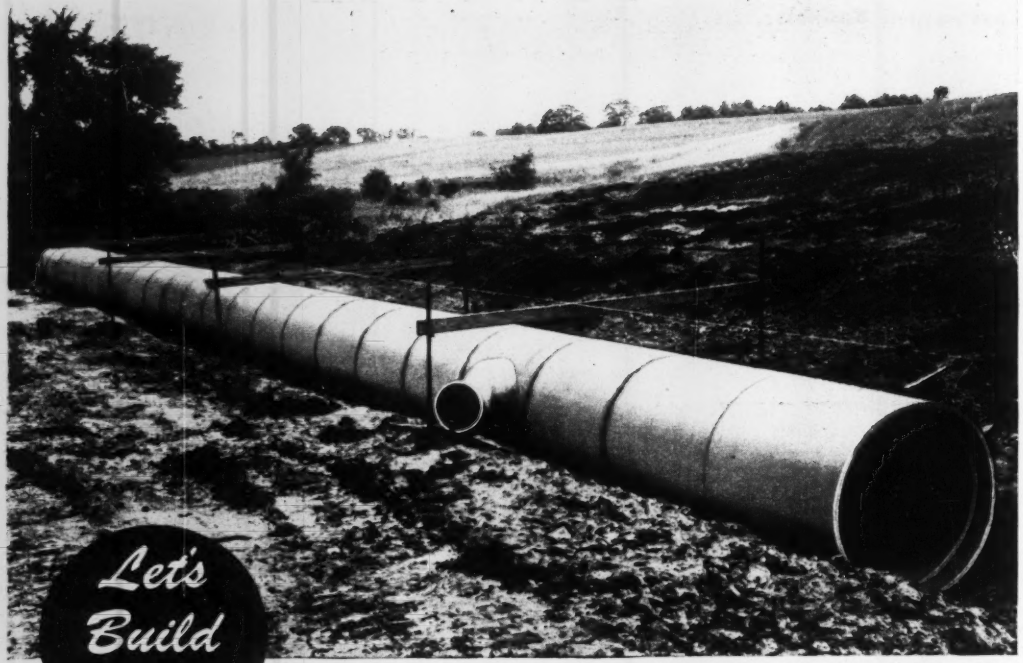


Rapidspray Maintenance Distributors. Also heaters for production melting of barreled asphalt.

Sheepsfoot Rollers
250 to 600 psi.

Pneumatic rollers
7 to 50 tons.

W. E. GRACE MFG. CO.
6015 S. Lamar Dallas, Texas



Ohio State Highway Project 124, Trumbull County, Ohio.
Contractor — Herkner Construction Company

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There is no putting off action from day to day if America's highways are to be adequate. Too little and too late has a warning for us. Working together means getting together over the finest highways in the world. There is no "keeping 'em rolling" with highway bottlenecks.

Our companies are proud in providing the drainage that makes secure a vast net work of super highways. We join with you and every American business in believing that hard roads are highways to National accomplishment. Highways are a vital forward link in the Nation's economy . . . in world peace. Let's build them . . . Let's modernize highways . . . Let's get America out of the highway rut.

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Sewer Pipe (Vitrified)	Slipseal Sewer Joint	Flue Lining
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• UNIVERSAL SEWER PIPE CORPORATION
• UNITED STATES CONCRETE PIPE COMPANY

• *GENERAL OFFICES* • 1500 Union Commerce Building • CLEVELAND 14, OHIO

Intercepting sewer, Del.

Part of the Wilmington, Del. Sewage Treatment Project, a $1.8 million intercepting sewer includes construction of pipe sewers; and two siphon chambers, one on each bank of the Christina River. Whitman, Requardt and Associates of Baltimore are consulting engineers to the Board of Directors of the Street and Sewer Department.

The contractor must furnish all labor and materials, also furnish and install tide gates and support railroad tracks to meet the specifications of the Railroad Company.

The low of 9 bidders, Jan. 29, 1952 on Intercepting Sewer C, Contract 5 was the joint venture combination of J. L. McIlvaine and Able Companies. They agreed to complete the job in 490 calendar days—135 days longer than the second lowest bidder, Intercounty Construction Company whose price was $68,078 higher.

Bidders include:

1C J. L. McIlvaine Co. & Able Co.... Washington, D. C.
2 Intercounty Constr. Co..... Hyattsville, Md.
9 Buckley & Co., Inc..... Philadelphia, Pa.

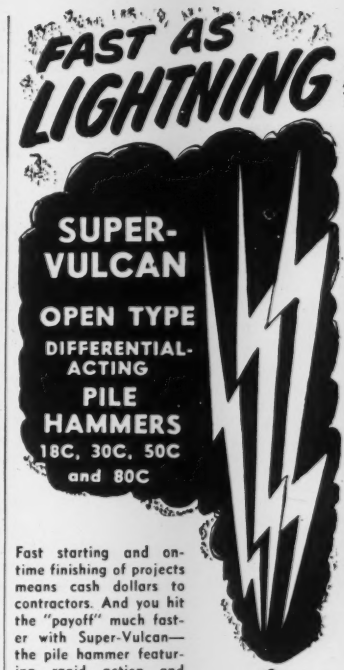
Bids: 1-29-52 Items	Unit	Quantity	Unit prices 1 C	2
Earth exc & refill for				
8" sewers under 8'	lf	20	$5.00	$6.53
8'-10'	lf	70	6.50	8.41
over 10'	lf	90	8.00	10.27
12" & 15" sewers under				
8'	lf	140	6.50	6.68
8'-10'	lf	200	8.00	8.59
10'-12'	lf	120	9.50	10.51
over 12'	lf	20	11.00	12.42
18" sewers under 10'	lf	700	9.50	7.49
10'-12'	lf	280	11.00	9.15
12'-14'	lf	360	12.50	10.82
14'-16'	lf	80	16.50	12.49
over 16'	lf	170	20.00	15.49
20"-24" sewers all depths	lf	70	15.00	11.09
30" sewers all depths	lf	40	18.00	11.93
42" sewers all depths	lf	30	22.00	14.40
60" sewers, 0'-14'	lf	70	30.00	27.09
over 14'	lf	150	30.00	31.26
66" sewers, under 14'	lf	70	38.00	23.25
14'-16'	lf	890	40.00	26.83
16'-18'	lf	570	43.00	30.40
over 18'	lf	810	47.00	33.98
72" sewers under 12'	lf	140	49.00	19.38
12'-14'	lf	1,000	54.00	22.91
14'-16'	lf	2,500	61.00	26.43
16'-18'	lf	280	67.00	29.94
over 18'	lf	20	72.00	33.48
78" sewers under 18'	lf	390	39.00	31.41
18'-20'	lf	370	44.50	35.10
20'-22'	lf	780	49.00	38.80
22'-25'	lf	370	53.00	43.42
over 25'	lf	420	57.00	49.88
Earth exc & refill for water main installation	lf	1,000	2.00	1.42
Earth exc & refill for struct other than outlet structures	cy	6,320	7.00	10.80
for outlet struct	cy	480	14.00	33.98
Tun exc for 66" dia	lf	80	98.00	240.00
Sewer 72" dia	lf	320	107.00	275.00
78"	lf	200	107.00	265.00
Exc below subgrade	cy	190	7.00	1.40
Exc & earth refill below subgrade	cy	950	7.00	4.00
Test pit earth exc & refill,				
0'-10'	cy	170	6.00	5.00
0'-15'	cy	10	9.00	10.00
0'-15'	cy	10	12.00	15.00
Rock excavation	cy	1,290	24.00	20.00
Grav or crushed stone rfll	cy	670	12.00	7.00
Earth filling & grading	cy	3,650	2.50	1.77
F&o topsoil, fert & seed	sy	680	1.50	1.48
Wd shting & shoring left in place	MBM	180	140.00	65.00
Lumber left in foundation	MBM	10	150.00	100.00
Temp stl sheet piling	sf	15,380	0.50	0.89
Mech tamped backfill	cy	8,000	2.80	3.70
Haul exc material to stockpile & rehaul for backfill	cy	8,000	2.80	2.07
Borrowed backfill	cy	6,000	5.50	5.00
F&I RCCP sewers (short length of 21" RCSP to be paid for as 24" RCCP) 15"	lf	30	2.50	6.03
18"	lf	1,590	3.00	6.52
24"	lf	20	4.50	8.16
42"	lf	30	11.00	21.30
F&I RCCPX sewers 60"	lf	30	21.00	37.36
66"	lf	2,420	26.00	38.55
72"	lf	4,260	30.00	42.64
78"	lf	2,530	34.00	48.72
F&I RCCPX sewers fully-lined with vit clay lnr plt 60"	lf	190	30.00	46.32
F&I VCPX sewers 8"	lf	180	1.20	1.95
12"	lf	330	2.50	3.68
Remov & relay exist sewers				
12"	lf	60	3.50	4.33
15"	lf	60	5.00	6.27
20"	lf	50	10.00	9.46
30"	lf	40	15.00	36.95
Replas sewer house conn	lf	120	3.00	6.06
F&I under-drains 8"	lf	1,160	2.00	1.48
Remov & salvg c i wtr pipe	lf	1,000	1.00	9.98
Lay salvgd &/Or f&l new ci water mains	lf	1,000	2.50	5.91
Relocating fire hydrants	ea	3	60.00	25.00
Relocat vlvs & vlv-boxes	ea	3	60.00	50.00
Replac wtr house conn	ea	150	2.00	2.00
F&p Class 1 a concrete	cy	4,400	77.00	44.56
Class III b concrete	cy	140	75.00	58.63
Class V concrete	cy	3,800	25.00	26.60
Furn materials for & constr brick masonry	M	95	130.00	169.97
Cut & replac pav in state rds	sy	25	6.00	13.82
rds other than state rds				
Type 4	sy	3,810	6.00	13.30
Type 5	sy	280	5.00	12.56
Type 6	sy	1,290	5.00	1.92
Type 7	sy	300	6.00	19.21
F&p reinforc steel	lb	639,275	0.14	0.19
iron castings incl manhole cov frames, steps, etc	lb	23,660	0.18	0.13
misc metal products	lb	25,890	0.27	0.27
Untreated wood piling	lf	12,000	2.60	4.43
Supprtg ra lroad tracks as req by Railroad Co	lf	3,000	2.00	5.91
F&li tide gates 15"	ea	1	140.00	200.00
20"	ea	2	250.00	315.00
30"	ea	3	460.00	603.00
36"	ea	1	575.00	763.00
54"	ea	1	1,750	2,490
60"	ea	1	2,300	3,290
66"	ea	1	3,200	4,470
Cut & replac pav in conc walks	sy	30	5.00	7.39
Remov & reset conc curb & gutter	lf	130	2.50	4.43
F&i sewage regultrs & appur complete 5' x 6'	ea	2	800.00	1,395
7½' x 7¾'	ea	1	1,100	1,925
7½' x 9¾'	ea	1	1,200	2,063
12' x 15'	ea	1	1,800	3,250
21' x 47½'	ea	2	7,000	11,460
Guniting	sf	12,370	2.00	1.48
Constr siphon struct north bank of Christina River	ls	1	12,000	33,085
south bank of Christina R	ls	1	10,500	27,950
Remov exist Linden St. bridge over Shipley Run & surf new bridge with blacktop paving	ls	1	2,500	500.00
Clean out exist paved chan (Shipley Run)	ls	1	4,000	3,570

Sewage disposal plant

City of Rice Lake, Wis. furnishes

Item	Cost	% of Total
Comminutor	$5,715	1
Sewage pumps, water pumps, & breaker assem	3,440	0.9
Sludge pump	1,009	0.3
Rotary distributor for filter gas holder cover, circul mixer, etc	19,665	5
Gas safety equip & external sludge heater	9,765	2
Sludge scrapers & cross collectors	16,084	4
Piping & fittgs (lead & jute by contr)	10,272	3
Valves	4,018	1
Wrought iron pipe	472	0.1
Reinforcing steel	21,830	5
Misc iron & struct steel	13,367	3
Electrical work	10,522	3
Parshall flume meter & Kennison nozzle	2,107	0.5
Equipment sub total	55,676	14
Material sub total	62,588	16
General contract—to furnish and install all equip, matls & labor other than above and to install above—incl. intercepting and outfall sewers, grating etc	$281,154	70
Total	$399,418	100

Consulting engineers on this project are Davy Engineering Co., La Crosse, Wis., general contractors are Bahr Construction Co., Wausau, Wis. Original bids taken in May were $50,000 higher than the combination of equipment shown here.



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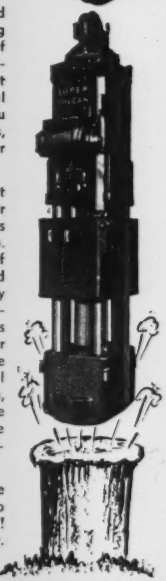

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WSB accuses homebuilder

Another building contractor has been formally charged by the Wage Stabilization Board with paying above-ceiling wages to bricklayers.

Target of WSB's enforcement crackdown this time is Burns Construction Co., one of the largest homebuilders in Denver.

Burns Construction is accused of paying illegally-high wages to bricklayers and hod carriers from January to May of last year on home construction in the Denver area. Margaret Reef, of the regional WSB staff at Denver, told ENGINEERING NEWS-RECORD that the charges followed investigation by the national WSB of complaints from other contractors that Burns Construction was using the higher wages to "pirate" their bricklayers and hod carriers.

Two construction contractors already are involved in charges of being too liberal in paying bricklayers in Ann Arbor, Mich. one is Hedin Construction Co., (ENR Mar 6 p.27) whose appeal of findings by the regional WSB enforcement commission at Detroit was heard last week by the National Enforcement Commission in Washington.

Under the findings, $40,000 of Hedin's wage costs will be disallowed as a cost for income tax purposes and another $40,000 will be deducted from the fixed price of the $7,152,000-hospital the contractor is building for the Veterans Administration.

• **Others cited**—The other is Anchor Fireproofing Co., also accused of paying too much to bricklayers on an Ann Arbor hospital project. Hearings have not yet been held.

WSB investigators are also investigating charges of wage violations in the construction industry in Buffalo, Dallas and San Francisco, according to Reid Williams, counsel of the Denver regional WSB.

Total amount of wages allegedly paid in violation of the wage-control law by Burns Construction is not disclosed by WSB's Denver office. It is claimed that the contractor, during the five-month period, paid 37 bricklayers four dollars an hour (when his legal rate was three dollars) and 19 hod carriers $2.25 an hour when his legal rate was $1.85).

Area rates have not yet been established by the Construction Industry Stabilization Commission for these crafts in the Denver area. The union scale at the time was three dollars and $1.80, respectively, for bricklayers and hod carriers.

Frank L. Cowton, president of Burns Construction, denied any violation of the controls law. He told newspapermen: "We were paying the going rate."

He will be given a hearing on March 22 before the regional enforcement commission in Denver and will have a right to appeal an unfavorable decision to Washington. The commission is headed by William E. Doyle, deputy city attorney in Denver and former judge.

Union agreements ease inter-trade troubles

Some AFL building trades unions are making national agreements which they hope will lead to settlement of more jurisdictional disputes without resort to the machinery of the Union-Industry National Joint Board for settling jurisdictional disputes.

The trend, applauded by Richard J. Gray, president of the AFL Building Trades Dept., comes at a time when the Joint Board is on shaky ground as a result of the withdrawal of the International Brotherhood of Electrical Workers and two employer groups, National Electrical Contractors Association and National Association of Master Plumbers.

The agreements do not invalidate the compulsory features of the Joint Board, whereby the board may intervene to decide unsettled disputes. Rather, they serve to keep disputes from getting to the joint board if they can be settled by the unions themselves. This reduces the burden of work carried by the joint board, headed by John T. Dunlop as impartial umpire. Moreover, the contractors who have a voice on the tripartite Joint Board, are left out of the national agreements made by unions.

• **Agreements made**—Iron workers have made agreements with the boilermakers and with the sheet metal workers. The sheet metal workers are also in the process of making an agreement with the carpenters.

Gray is still hopeful that some way will be found to bring the IBEW back into the Joint Board plan, which is supposed to be binding on all 19 AFL unions affiliated with the Building Trades Dept.

Union boycotts city in dispute over wages

An unannounced union boycott of city and city-allied construction projects in Pittsburgh threatened to close all city jobs and cut off employment of union members in the building trades.

The trouble started with a battle between William G. Shord, business representative of Local 5, International Brotherhood of Electrical Workers, and members of the city administration and city council, P. T. Fagan in particular.

Shord demanded concessions on hours and wages for a number of city workers. Council ignored the demands despite a telegram to Edward J. Leonard, then councilman, from Shord, which said, in part:

"We expect members of council to live up to the much publicized declarations that the city pays current union wages. . . ."

One month ago the Morganstern Electric Co. doing installation work at the city's turberculosis hospital told the city that work had been stopped. Work stopped, according to the company, because of a disagreement between IBEW and the city.

The IBEW also pulled men off a contract job for installing traffic lights. George E. Fairley, director of public safety, warned that the boycott against installation of traffic lights may lead to accidents.

Work on the new parking garage, now under construction, was threatened, and Public Works Director James S. Devlin said it will be necessary to halt construction on the big Lincoln pumping station if the electrical contractor is stymied.

Contractor gets writ; halts union interference

Nashville, Tenn., contractor R. E. Martin has obtained a temporary injunction against several AFL unions and their local leaders prohibiting them from interfering with construction work on State highway 61 between Clinton and Oak Ridge, Tenn. A permanent injunction is being sought to prevent further interference.

It was charged in the injunction petition that the union officials re-

cently halted the road work and demanded that the contractor discharge present employees and hire AFL union members. Also demanded he give up the contract with the United Construction Workers union.

• **Other orders**—The Ohio Supreme Court granted the W. E. Anderson Sons Co., of Columbus, Ohio an injunction against picketing by a local of the AFL International Brotherhood of Teamsters, Chauffeurs, Stablemen and Helpers of America. The union picketed construction work at Ohio State University's health center in 1949 because Anderson did not employ union drivers on its trucks hauling gravel. The firm held a sub-contract. The court held this to be an illegal secondary boycott. . . The National Labor Relations Board issued an order that ended the practice of some building trades unions in requiring a worker to join the union, as a condition of employment, without ever having qualified legally to do so. It issued the order against the Los Angeles Building & Construction Trades Council, AFL; the Hod Carriers and Common Laborers Union Local 300; and Paul W Speer, Inc., contractor for whom the council made a compulsory union contract for the hod carriers.

Strike settlements

Work on the 10-mi water power tunnel at Aluminum Co. of Canada's project at Kemano in British Columbia was stalled for two weeks by a wildcat strike of some 275 miners who wanted more pay and decided they might get it by switching unions.

The miners, largely Mine-Mill union members, were working under International Hod Carriers' and Laborers' Union (AFL) jurisdiction at $1.60 per hr. They repudiated the AFL union, walked out, sought a mine-mill contract. Alcan said no, brought in replacements who refused to work.

Finally, Mine-Mill and the AFL officials got together, worked out an agreement, and the men went back to work pending negotiations with contractor Morrison-Knudsen Co.

• **Other settlements**—Union Roofers, affiliated with an AFL union with headquarters in Syracuse, N. Y., reported a six weeks' strike over wages and other benefits has been settled in Utica, N. Y. . . . Construction work on the atomic-energy project near Paducah, Ky., halted by a sheet-metal-workers picket line was resumed under a "tentative agreement." . . . Workers resumed work at the $54-million Aluminum Ore Co.'s Benton, Ark. plant.

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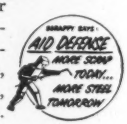

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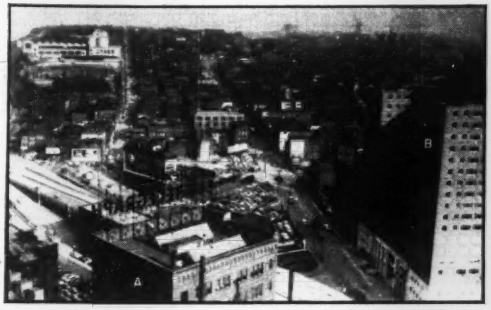
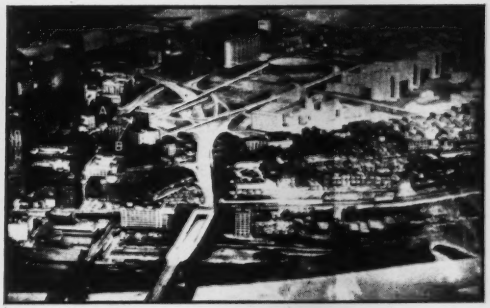




TWO VIEWS OF PITTSBURGH'S HILL DISTRICT which show the civic auditorium and center which is intended to take the place of a slum area. The building marked A is the Sun-Telegraph building, and the building marked B is a new apartment house in the area. The left view shows the area as it looks today and the right view shows the area as it will look.

Civic center planned to replace slum

If Pittsburgh's blighted, slum infested Hill District is to be rebuilt, the planners must shortly decide what they want to do with the 105-acre district. The slum clearance and urban redevelopment authority of the Housing and Home Finance Agency has set aside $5 million for use in acquiring and clearing the site, but a plan must be submitted before the end of 1952.

In 1947, the Pittsburgh Regional Planning Association produced a plan for a $13-million Pittsburgh Center, a combination sports arena, auditorium and industrial exhibit hall. Surrounding the center were planned hotel and apartment buildings of the most modern design. This or some other plan must be on file in Washington, D. C., before the deadline.

The association hopefully turned the proposed project over to the Pittsburgh Chamber of Commerce. And there it appeared to rest. Now that the deadline is approaching some civic thinkers have stirred up new interest in the project.

One of their newer ideas is construction of a huge central building on several different levels, each of which would be a separate entity in itself. The building might house a sports arena and convention hall on one level with a seating capacity of 15,000. Other levels would provide space for the city's symphony orchestra, civic light opera and playhouse.

• **Money problems**—The federal government has earmarked $5 million for use by the urban redevelopment authority in clearing the land now occupied by about 3,000 families. The state will provide $1 million and the city another $1.5 million mostly for new street patterns and relocation of water and sewer lines.

The authority hopes to find business groups willing to take over acreage not needed for the central civic structure. Those private interests would build hotels, apartments and retail centers in accordance with the urban redevelopment sections of the Housing Act of 1949.

It has been suggested that construction of the huge civic center could be financed by the several trust and endowment funds which have been set up in Pittsburgh for charitable purposes. Altogether these funds have about $100 million, but most of this money is already committed to other projects.

It is out of the question for the city to build such a center: Its bonding authority is not sufficient to produce the needed capital.

Public subscription offers a possible financing method. Such a plan was used to help construct the University of Pittsburgh's Cathedral of Learning.

• **Get ready**—All discussion of the proposed redevelopment has taken on urgency in recent months because of the time table set up to enable the urban redevelopment authority to qualify for a federal contract. Through the contract the authority hopes to obtain an advance on the $5 million to be used for clearing the area.

Further the planners must make an appraisal of property values in the district, take an accurate census to help in relocation work, make a topographical survey and complete a market analysis.

If the city planners can make up their minds on how to answer the government's demand for definite plans and information, the clearing work could start sometime this year. Families forced to leave the area have been promised help in relocation in accordance with the redevelopment law.

Parking laws offered as cities fight problem

A bill designed to encourage construction of off-street parking facilities in Buffalo by allowing tax exemption for such projects was introduced in the New York State Legislature.

The proposed legislation would permit Buffalo to grant tax exemptions for a maximum of 15 years on buildings which may be constructed for off-street parking of automobiles or on existing buildings which may be converted to such uses.

Several Buffalo groups have indicated that they would undertake to build parking facilities if they were given sufficient tax relief to make the projects financially feasible.

The legislation carries three important requirements: The time limit to complete a project would be the end of 1955; the structure would have to be able to service at least 150 cars; and at least 75% of the floor area would have to be for the exclusive use of parking. The portion not so used would be taxed.

• **Milwaukee, Wis.**, parking commission—Reporting to the city council

(*Continued on next page*)

Municipal . . .

of Milwaukee, Wis., the city's parking commission replied to a request by private interests that the city remove itself from the parking business with a rejection of the request.

The Milwaukee Garage and Parking Association had asked that the city not compete in any way with privately operated lots. The parking commission rejected the request for two reasons: The first was that private enterprise had not provided enough off-street parking to meet automobilist's needs or to improve traffic flow. The second was that much of the ground level parking was on land owned by the city and leased to the operators anyway.

• **Other parking measures**—An ordinance outlining the procedures necessary for the development of off-street parking facilities was introduced in the City Council of Kansas City, Mo. The Wilmington, Del., Parking Authority is considering the extent of assistance it will need from professional consultants to develop off-street parking facilities. It held a meeting with representatives of two engineering firms, Whitman, Requart and Associates, and Coverdale and Colpitts. Proposals controlling alley and street parking in Denver, Col., were submitted to Mayor Newton by trucking and business groups.

$59-million housing loan heads activities in field

New York State lent $59,180,000 to the New York City housing authority for construction of two low-income housing projects in Manhattan and Brooklyn.

With construction scheduled to begin early next year for completion in 1954, the projects will house 3,800 families in apartments for which the rent will be $9 a room, including utilities. Only persons whose earnings range between $1,500 and $2,900 a year will be eligible to live in the developments.

Besides lending the city the money, which is to be repaid at 2% interest in 50 years, the state will pay up to $1,033,340 in cash subsidies each year for half a century to help keep the rental at the $9-a-room figure.

The new loan brought to a total of $410 million the amount advanced to the city by the state since state aid for housing began in 1939. During this period, 35,000 families, or more than 130,000 persons, in the low-income bracket have moved into 24 housing developments in all of the New York City boroughs, except Staten Island.

Baltimore housing

Ten 12-story buildings, Baltimore, Md., first elevator-type apartments for low-income families, are to be built on slum sites near the business district. Cost of the buildings alone will exceed $13 million. The project will be aided by federal and local loan funds.

Clearing of the 26 acres of slums may be completed in time for construction to start before the end of the year. Both sites are east of the Fallsway. In each project there will be 3-story "walk-ups" and 2-story row houses in addition to the elevator apartments.

The Baltimore housing authority said slum sites have become so expensive that more dwellings per acre must be put up to absorb site acquisition costs. Elevator buildings allow more open space between buildings and increase the area which can be devoted to landscaping and recreational uses, the authority decided.

• **Memphis Housing Authority**—Negro public housing in the south Memphis, Tenn., area will cost over $8 million. The housing authority has already begun buying up the slums which must be cleared before the project can be begun.

Purchase of the property will cost about $1 million.

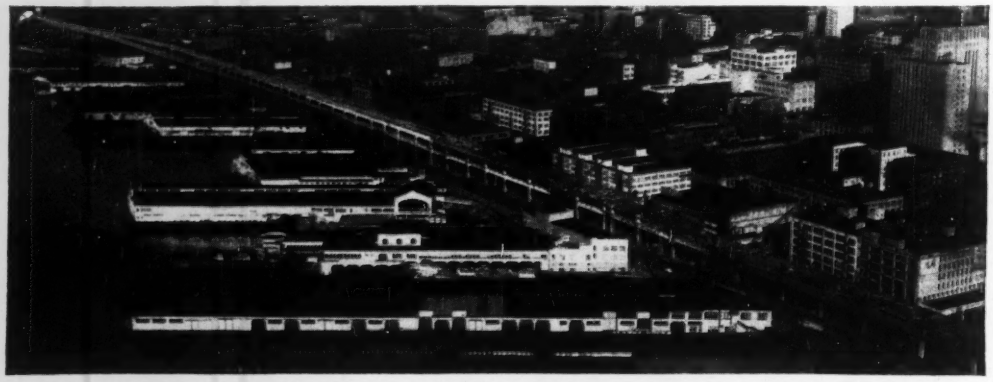
• **Charleston, W. Va.**—A 500-unit low-rent housing project for Charleston has been planned. The cost has been estimated at $6 million. The 55 buildings will be the second largest single construction project in the West Virginia Capital City's history.

• **Other housing projects**—The Atlanta Housing Authority plans construction of two projects to provide 800 living units at a cost of about $8 million. The two projects can be financed from $30 million in federal funds already allocated to Atlanta for a total of 3,500 living units.

Municipal briefs . . .

• **Airport revenues adequate**—The city council of Cincinnati, Ohio, was told that revenues from the proposed Blue Ash Airport will be adequate to support up to $5 million in bonds necessary to pay the city's half of the $9-million initial phase cost.

• **City may close airfield**—Brainard Field, Hartford, Conn., municipal airport may be closed following public hearings held at the city hall. One faction which favors closing urged that the land be given over to industrial use.



PROGRESS REPORT—The $10-million Alaskan Way viaduct, scheduled for completion this year (ENR Feb. 15, 1951, p 43), is pushing along the waterfront at Seattle, Wash. It not only will provide a by-pass of the business district but also a vantage-point for spectacular views of the waterfront. Contract for the final unit was awarded for $1 million. (Photo by Dexter)

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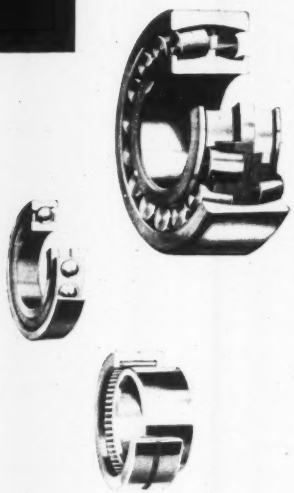

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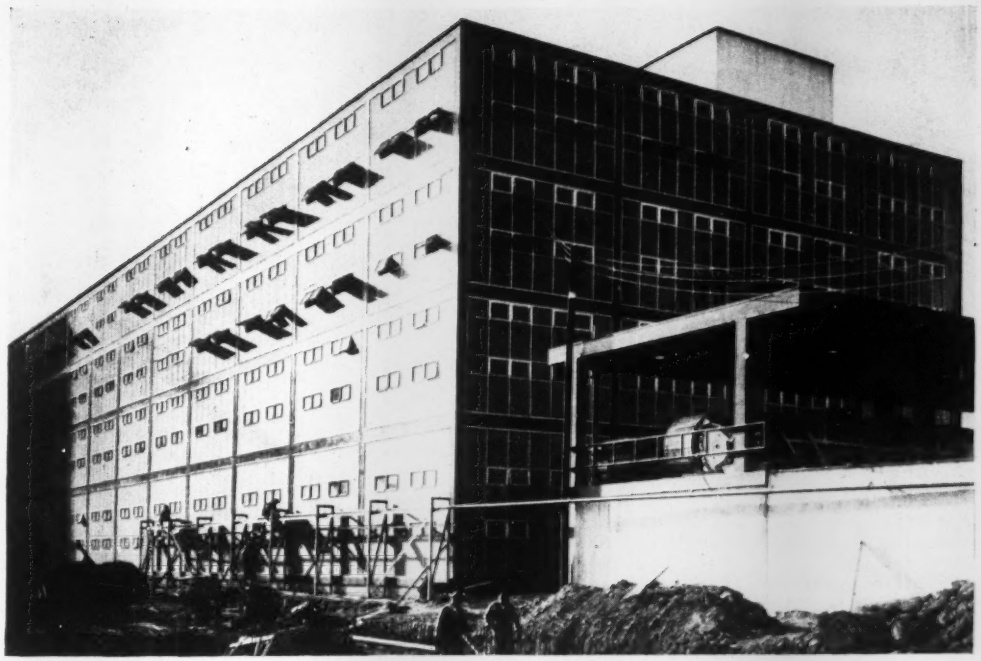


Glass walls, high bays, strange ground conditions made construction tricky on . . .

Colorful vinegar building and warehouse

THE NEW VINEGAR WORKS—a 3-story building—at the H. J. Heinz Co. plant in Pittsburg, Pa., has a striking appearance. Windows with heat-absorbing blue-colored glass extend from ground to roof. In sharp contrast with the blue glass, the sash is aluminum, and the exterior structural members of the building are exposed and painted black.

An adjoining 3-story warehouse, now under construction, will stand out sharply against this background. It will have solid walls of white brick.

But from an engineering viewpoint, there's more to these buildings than meets the eye:

Built near the Allegheny River, their design was influenced by dangers of flooding. Subsurface conditions were peculiar. Floor loading is unusually heavy. And some floor-to-floor heights are large, making shoring of the formwork for the concrete floors a problem. The contractor found an excellent solution in rolling forms and a clever reshoring method.

The vinegar building is 88x308 ft in plan and the warehouse 250x500 ft. In other words, the two structures occupy a ground area near the river of about 150,000 sq ft.

• **Piles won't stay put**—Foundation conditions, as indicated by soil borings taken over this area, seemed prosaic. Under fill and clay, at a depth of 15 to 35 ft, lies gray and red shale, the hardness of which varies. Piles were required, but they could be brought to bear on the shale, which the borings indicated should be capable of supporting them. Step-tapered concrete piles were chosen for the job.

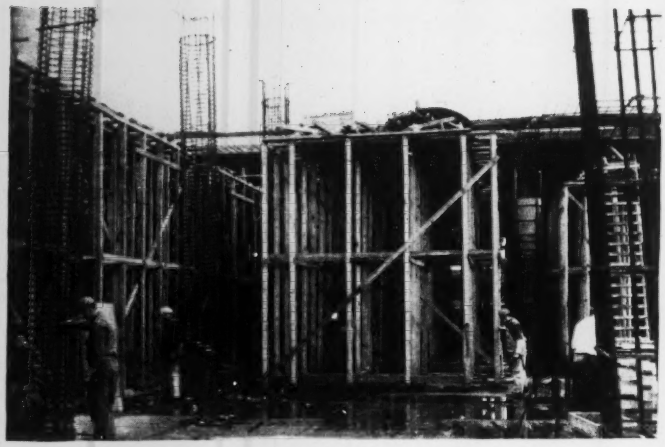
A strange phenomenon occurred, however, after the piles were driven. Though Raymond Concrete Pile Co. hammered them to apparent refusal, they later—usually the next day—could be redriven another 3 to 18 in. Some piles could be redriven as many as five times.

Moran, Proctor, Mueser & Rutledge were called in as consultants. Their studies indicated that friction along the surface of the pile was of no significance. The trouble appeared to lie in the shale. In some cases, it is believed, the piles punched through a thin layer of soft shale, through a layer of sand, then into another layer of shale.

But while several theories have been advanced to explain the phenomenon, the consultants have not arrived yet at a definite conclusion. (Most plausible explanation is that the pile driving damaged the shale at the tips of adjacent piles, enabling those to penetrate further when redriven.) However, the consultants did work out a suitable procedure to assure a safe, stable foundation.

They zoned the site into two types of driving area. In one zone, all piles had to be redriven. In the second, a few piles were selected for redriving, and if trouble was encountered with any of these, a group of piles in the vicinity also was redriven.

• **Window walls**—Above the first floor, the vinegar building has a structural steel frame. For ease in inspection and maintenance, all steel is exposed and is painted with blue lead shop and field paint. Outer surfaces of exterior columns and spandrels, however, are finished with a black paint, which was chosen for its flexi-



FALSEWORK that supported forms for the warehouse floors was moved on wood rollers for re-use in the next bay.

bility and durability under large temperature changes and continued applications of water.

There is no masonry in the exterior walls. Framed between the exterior structural members—spandrels and columns—windows occupy the whole outer surface. These are glazed with ¼-in. thick blue-colored glass, designed to eliminate glare, absorb heat and admit a maximum of natural light.

The panes are claimed to be self-washing. They have a pebbly surface, so that rain tends to clean them. Most panes are fixed, but there is some horizontal projecting sash for ventilation.

• **Heavy live loads**—Because of the danger of floods, the first floor of the vinegar building was raised 4½ ft above existing grade. Of flat-slab construction, it is supported on 10-ft high piers, which transfer the load to the pile caps. Piers are spaced 22 ft apart.

To simplify formwork, column capitals were absorbed into the piers. These were made 4½ ft square—the same size as the column capitals would have been. The short length of the piers made this construction economical.

The first floor, 20 in. thick, was designed for a live load of 1,200 psf. It has to carry 20-ft high, 43,000-gal storage tanks for vinegar. To provide sufficient space for these tanks, the first story was made 30 ft high. Second and third stories are 14 ft high. (A line of spandrel beams about 16 ft above the first floor makes the building appear four stories high from the outside.)

For floors above the first, the live load was set at 300 psf. Floors and roof are reinforced concrete and are supported on steel beams generally spaced about 7½ ft apart. Columns are 22 ft on centers in both directions.

The 3-story warehouse also was designed for heavy live loads—750 psf. It has a reinforced concrete frame up to the third floor—mostly of flat-slab drop-panel construction. Supported on columns spaced 20 ft 6 in. apart, slabs are 12 in. thick and have an iron-hardened finish.

The roof slab, of cast-in-place gypsum, is supported on structural steel. Glass-fiber board served as formwork and was left in place for insulation.

• **Rolling forms**—The first story in the warehouse is 12 ft high, but each of the next two are 25 ft. This posed a problem for the contractor, because of the height of shores required to support the formwork for the floors.

His solution was to support the forms on platforms carried by heavy timber columns. For this to be economical, the platforms had to be designed so that they could be re-used many times. Hence, he placed each platform unit on wood dollies.

Each platform was large enough to enable a complete bay to be cast at one time—between column center lines in one direction and panel center lines in the other.

A series of platforms was erected to obtain sufficient working area. Before the forms were stripped and the platforms moved ahead, the cantilever section of the slab pour had to be supported in such a way as not to interfere with movement of the rolling platforms. For this purpose, the contractor placed along the column center lines at midspan a 6x6 timber column with a 6x6 timber T-head on top to hold up the slab edge at those points. At the center of the panel, between these timber columns, he supported the slab edge on another horizontal 6x6 timber. This, in turn, he hung on U-bolts that passed through sleeves in the concrete floors and over a steel beam above. Placed along the end of slab pour, this beam, blocked up off the floor with timber pads above the timber columns, was supported by the two timber shores.

• **Other noteworthy features**—There are no windows in the warehouse, except in the mezzanine offices. Exterior walls are white glazed brick, backed up with 8-in. cinder block. In the storage area, lighting is incandescent and heating is accomplished with unit heaters supplied with 100-psi steam.

The warehouse is served by two two-track railroad sidings. Both extend the full length of the building, but the slope of the site permits the siding on one side of the building to be at first-floor level and the one on the opposite side at second-floor level. This slope also enabled loading platforms for trucks to be placed at two levels at one end of the building. A third loading platform is at first-floor level at the opposite end.

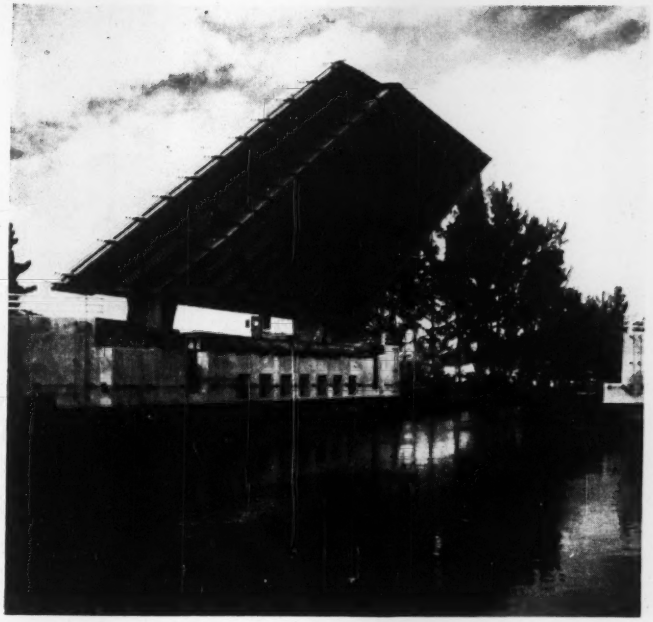
The vinegar building has fluorescent lighting and is heated with low-pressure steam unit heaters. It is also fitted with sprinklers for fire protection.

Processing areas generally are not enclosed, but for sanitary reasons, the filling room on the third floor had to be. Aluminum movable partitions with glass windows were chosen for this purpose. For fixed partitions, glazed structural tile is used.

Built contiguous with an existing power station, the vinegar building will incorporate an expansion of that plant—a 3,000-kva turbine-generator, feedwater treatment, air compressors. Nearby also are six concrete grain silos, each of 2,000-bu capacity. These feed grain underground to the grain-handling system in the building.

Both buildings were designed by Skidmore, Owings & Merrill. Richard Salman was resident engineer for the architects. George A. Fuller Co. was the contractor. The work was carried out under the supervision of C. C. Roth, vice president, and R. J. Nolan, construction manager. Rizzi Construction Co. did the concrete work in both buildings, with A. J. Trione as project manager.

For H. J. Heinz Co., R. W. Locke is project manager and H. L. Dunker, manager of engineering. This construction is part of a $15 million expansion being built under their supervision.



MIAMI CANAL CROSSING with 45-deg skew is second of its type.

Skew bascule design puts bridges inside budget limit

DADE COUNTY, FLA., is completing two movable bridges over the Miami Canal on which it saved $160,000—that's $80,000 per bridge—by using the Hanover skew bascule.

These two skew crossings of the Miami Canal—identical, but opposite hand—are the second and third applications of a design patented by Clinton D. Hanover, Jr., when he was chief of bridge design of New York City's Department of Public Works. Its first use was on the Hamilton Ave. crossing of Gowanus Canal in Brooklyn, where twin single-leaf structures carrying divided-lane traffic were opened for operation in 1944 (ENR June 15, 1944, page 872).

Generally the same as this first bridge in framing and identical in principle, the two new Miami structures have these advantages claimed for the design:

- Economy inherent to fitting the channel exactly, with no waste span length due to the skew;
- Least obstruction to navigation thanks to piers being parallel to the channel.

The first of the above factors, economy, guided choice of the design for the two crossings. The Dade County Board of Commissioners had a limited amount of bond money with which to build them. Choice of the design was made by the consultants, Earle M. Rader and Knappen-Tippetts-Abbett-McCarthy. Then Hardesty & Hanover of New York were retained as associate consultants on the superstructure design.

- **Cost comparison**—Detailed cost analyses showed that conventional square bascules for the skew crossings would have to be double-leaf structures 162 ft c to c of trunnions—to span just 50 ft of clear channel width between fenders. Operating equipment would have to be in duplicate for the double leaves. Total cost of these square bascules was estimated at $1,094,000, exclusive of approach work. Cost of two Hanover skew bascules was estimated at $894,000. This indicated $200,000 saving was cut to $160,000 because the approaches are longer for the skew design.

One bridge, at S.E. 4th Avenue in Hialeah, a Miami suburb, was completed in December, 1951, at a total cost of $516,000. The second, at NW 36th Street in Miami, a main thoroughfare leading to Miami International Airport, is scheduled for completion in June at a cost, including approaches, of $502,000.

Both are simple trunnion spans with a pit pier. The main girders are parallel to the roadway and connect at an angle of 45 deg through rigid joints to the steel tail girders which support the counterweight below the roadway.

The movable leaf of each bridge is made to fit the skewed channel precisely, and the tail girders are built normal to channel lines, thus making the leaf as short as possible and allowing the center-line of trunnions to be parallel to the channel. Since the piers are built in line with the channel, the channel flow is not obstructed.

The skew crossings maintain a straight alignment for both roadways across the river. Actually, one original crossing was at 43 deg. and the other at 48 deg, but both new ones are at 45 deg. This slight change has no noticeable effect on stream flow; pier faces are only skewed 3 deg away from parallel.

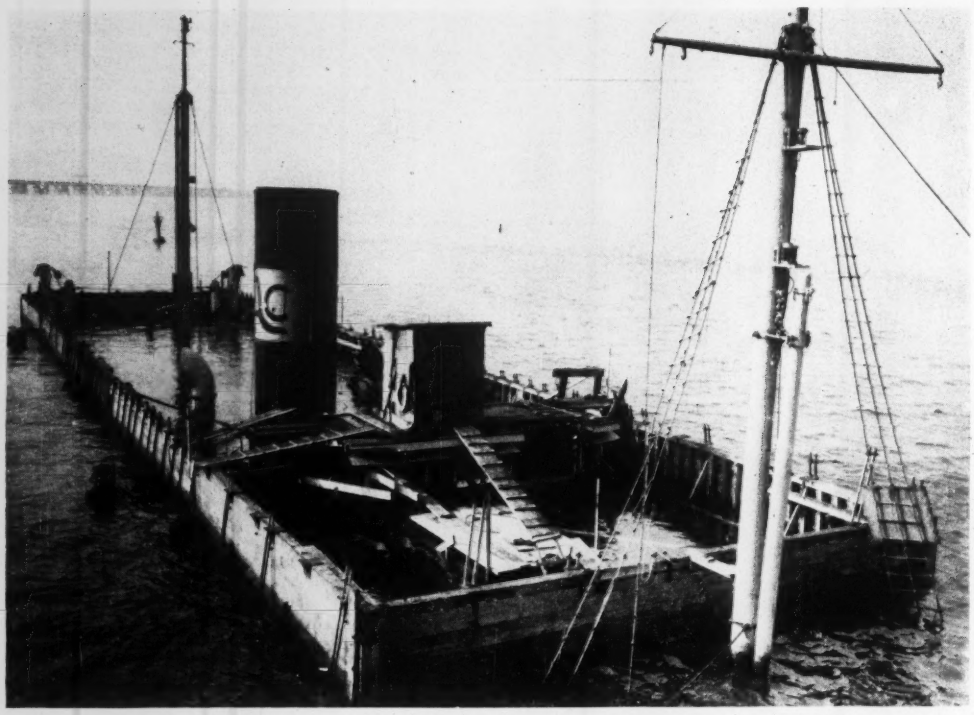
Bridge substructures are reinforced concrete piers on reinforced concrete pile caps on precast reinforced concrete piles. Piles are tied to the pile caps to take uplift transmitted from moments induced by the off-center superstructure of the bridge in its open position.

- **Clearances**—The bridges open to an angle of 78 deg with the horizontal. When down, they leave an 11-ft vertical clearance.

Decking is open steel grating. Main girders are 7 ft deep at the pit pier, 5½ ft at the rest pier end. Electric drives operate the structures; the control houses are at pit pier shores. Roadway widths are 44 ft between 9-in. steel curbs, and there is a 5-ft sidewalk along one side of each crossing.

Major quantities in both bridges were: 10,000 cu yd excavation; 28,000 cu yd embankment; 500 precast concrete piles, reinforced; 12,400 sq ft steel sheet piling (left in place); 6,800 cu yd concrete; 220 tons reinforcing steel; 690 tons structural steel, bearings and operating machinery; 7,000 sq ft steel roadway grating; 13,000 sq yd rock base and bituminous surface roadway.

Joseph G. Moretti is general contractor on both bridges. They were built under supervision of County Engineer E. A. Anderson, and H. Carl Thurston was resident engineer for the consultants.

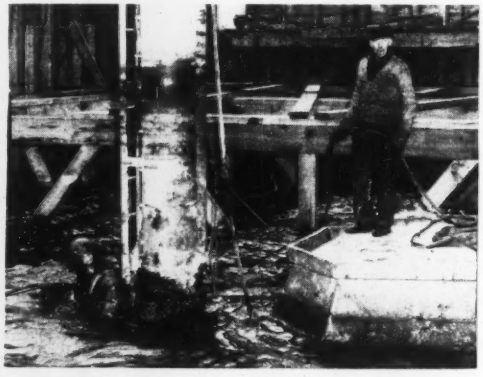


1. Cofferdam was formed with five panels on each side measuring 21 x 35 ft and two end panels 21 x 42 ft. These encircled two hoppers, engine and boiler rooms. Only dismantling needed on entire ship was wings of wheelhouse. (ENR photos)

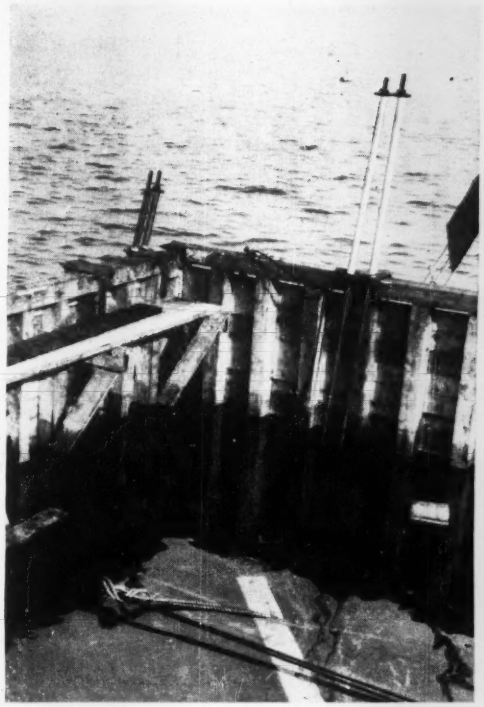
Contractor rescues dredge after 6-month mud bath

At 2 am on a murky morning last May the hopper dredge Sandmate, loaded with 4,200 tons of sand intended for the New Jersey Turnpike, wandered slightly out of her channel in Newark Bay and punctured her hull on submerged rocks. Water poured into the laden craft and down she went to mud, 40 ft below. Two sister ships, Sandchief and Sandcaptain, finished the job of delivering some eight million yards of sand dredged from the ocean

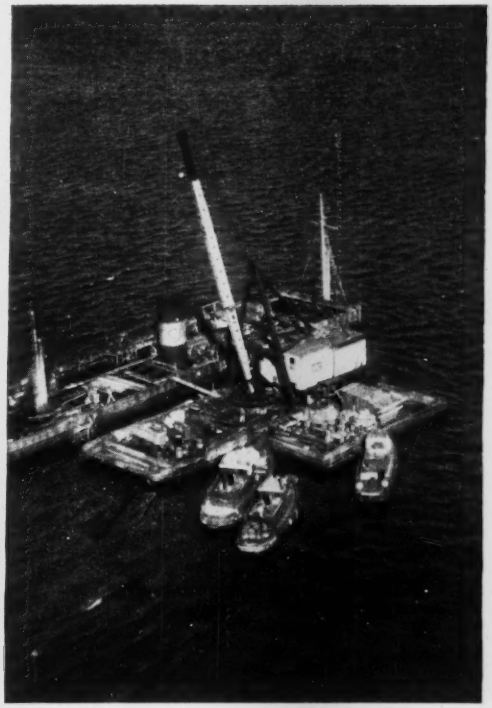
4. Hoist machinery on bow was first to break water after pumping began. Outside guide piles maintained level rise.



5. One of six divers goes under (near mast) to report on progress. Note one of 16 cross trusses now exposed.



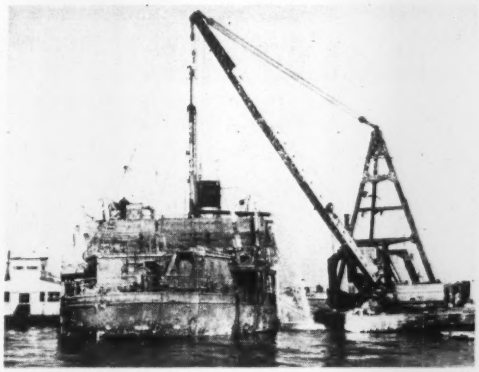
2. Panel uprights were 6 x 8's, faced with tongue-and-groove 2 x 6's. Tie rods ran down from forked plates to gunwale bar.



3. Dredge sank three miles offshore in Newark Bay, necessitating an attendant fleet and ship-to-shore radio setup.

floor in New York harbor, 15 mi away. The Sandmate's ignominy was heightened by the fact that she had recently set a record of 68 trips a month on a round-the-clock basis, carrying 2,700 cu yd each trip.

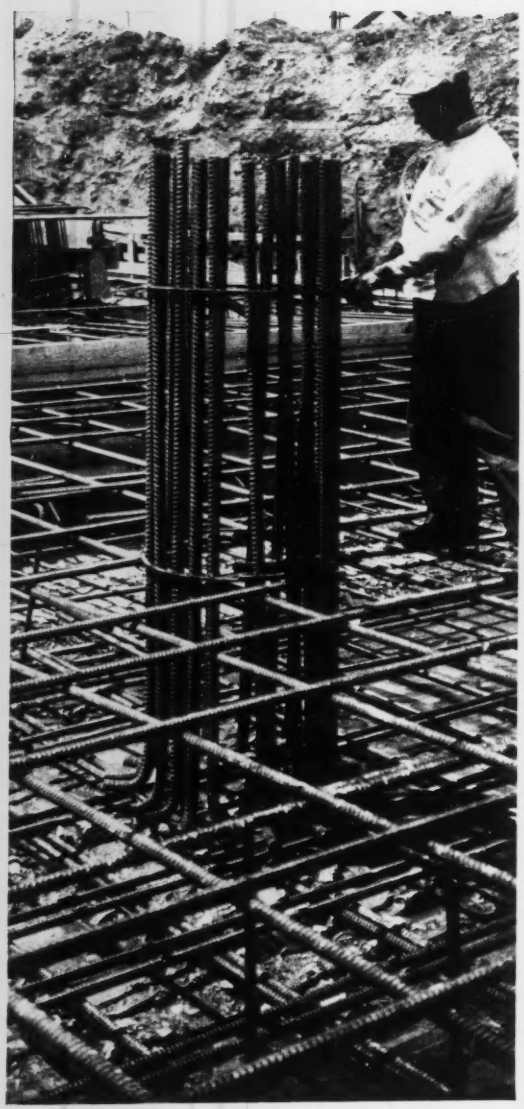
When the job was completed in late October the contractor, Construction Aggregates Corp. of Chicago and New York, set about raising the $3 million ship and salvaging her expensive (and by this time barnacled) machinery. A 12-panel timber cofferdam was erected on the deck, encircling the two main hoppers, engine and boiler rooms. Teams of divers patched holes in the forward hull and checked everything under water thoroughly. Ten pumps of 90,000-gph capacity were started at low tide. Slowly but proudly the ship emerged from the water, to be towed into drydock where this week she is well on the way to permanent recovery.



6. With total of 900,000 gph spouting over the wall the 3,000-ton ship continues to emerge, slowly but surely.

7. High and dry now in Bethlehem drydock at Brooklyn, N. Y., ill-fated craft will be returned to work in four months.

CONSTRUCTIVE



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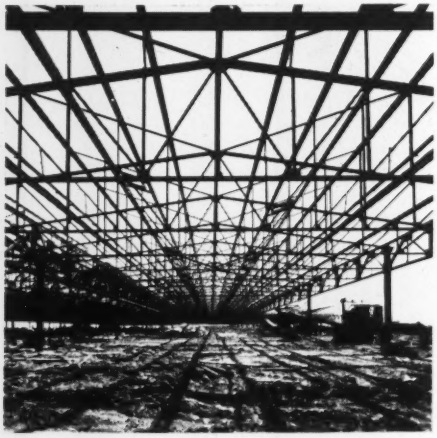

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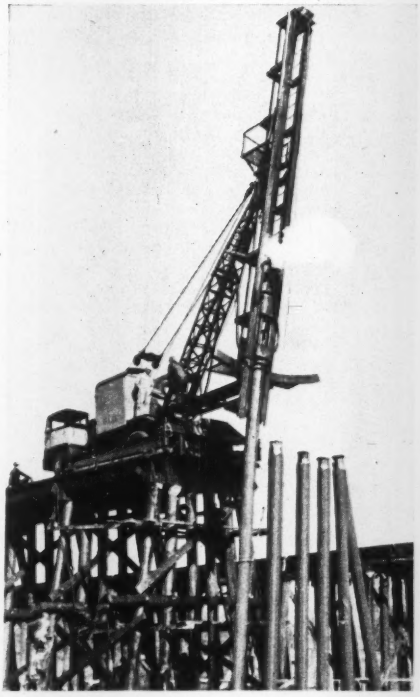

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Pavement load deflections measured by spring-supported subgrade

A MECHANICAL SUBGRADE is being used by the Civil Aeronautics Administration as an aid to pavement design studies now being made at its Technical Development and Evaluation Center at Indianapolis, Ind. Key elements of the test apparatus are 3,600 spring-supported steel plates, 2 x 2 in. square, that form a level bed 10 ft square on which actual pavements can be built and tested. Each spring operates within a rigidly supported cylinder. Each has been calibrated so that the vertical movement of the plunger by which it supports the plate gives a measure of the load it is carrying. Movement is measured electrically.

Three sets of springs have been provided, but only the weakest set has been used in tests made to date. Each inch of deflection of these springs represents a load of 350 lb per sq in.

Loads are applied to the pavement with hydraulic jacks, using plates (10 to 30-in. diam) or with airplane or truck tires. Some dual-tire load tests were made.

Details of tests made to date were given by Raymond C. Herner of the CAA Airport Division at the recent meeting of the Highway Research Board. Most of these tests have been made on pavement with a base course of fair quality, dense-graded gravel, with or without bituminous concrete surfacing. Gravel was spread by hand, in 4-in. layers, and compacted with vibrators. Dry densities ranged from 122 to 142 lb per cubic foot at moisture contents of 5 to 6%. Pavement thicknesses ranged from 4 to 24 in.

Most of the tests made to late were made on 8 in. of gravel. Tests on the 8-in. gravel included four rigid-plate diameters, both 36-in. and 47-in. airplane tires and two sizes of truck tires.

For each pavement section, three triaxial compression test specimens were prepared to establish a correlation between load-distributing properties of the material as measured in the load-transmission test and its shear strength as determined by the triaxial test.

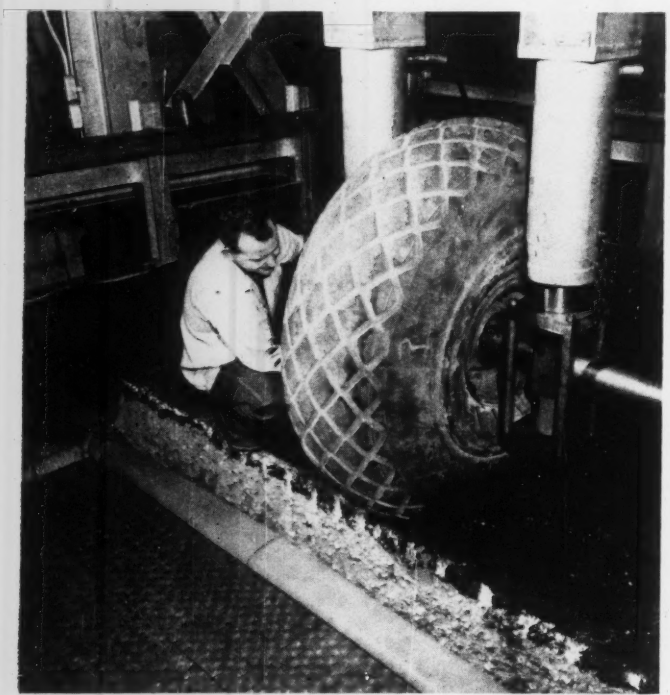
Data collected to date are too limited to permit definite design conclusions to be drawn, Mr. Herner said in his progress report to the Highway Research Board. He noted, however, that the tests with dual tires indicate clearly that use of dual tires is equivalent to a substantial increase in pavement thickness. Also, he said, from the few tests made with a bituminous concrete surfacing, there is some evidence that the load distributing value of asphaltic concrete has been somewhat overrated.

In discussing the use of these tests in pavement design, Mr. Herner said that development of a truly rational design method for flexible pavements will require knowledge not only of the load distribution on the subgrade but also an understanding of the stress-strain relationship within the subgrade soil mass. The data they are collecting will go far toward fulfilling the first requirement, and the stress-distribution project at the Waterways Experiment Station, Vicksburg, represents "an encouraging start on the second phase of the problem."

In the meantime, Mr. Herner added, "if the modulus of subgrade reaction k and a desirable limiting deflection can be determined by test or assumed from experience, it is possible to give the subgrade a load rating in terms of vertical load per unit area. It then is a simple matter to determine from load-transmission data a pavement section which will limit the maximum subgrade pressure to this value for any given loading condition.

"This approach falls short of a strictly rational design method. It has merit, however, as a simple approximate method which should yield usable results if applied with judgment."

Mr. Herner's report will appear in the Proceedings of the Highway Research Board. The test apparatus is described in detail in Technical Development Report No. 108 of the CAA Technical Development and Evaluation Center, Indianapolis, Ind.



METHOD OF LOADING the pavement section for airplane-simulated tests. In this picture, part of the pavement has been cut away and removed to show the 2 x 2-in. plunger tops that make up the mechanical subgrade. During each test, these plungers are protected by the rubber mat shown rolled up against the test pavement.

STANG LOWERS GROUND WATER 15′ KEEPS 1200′ TRENCH CUT BONE-DRY

DELTA-MENDOTA CANAL PROJECT

Contractor: MARSHALL, HAAS ROYCE

HEAVY rains increased the ground water hazard in the excavation of a 1200′ trench 15 feet below ground water level for a siphon pipe on the Delta-Mendota Canal Project, Yuma, Arizona. In spite of these conditions, the big concrete pipe was lowered into a bone-dry trench, in record time, at low cost, by using Stang Wellpoints. This is one more instance of the important part that Stang Wellpoints are taking in the excavation of irrigation canals and other sub-ground water level projects all over the United States.

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How to harden an airport runway base

Norman C. Bird
Chief Engineer
Illinois Department of Aeronautics
Springfield, Ill.

SOIL-CEMENT solved a vexing runway salvage problem at Cairo, Ill. airport.

Lying in bottom land between the Ohio and Mississippi rivers, the airport has a near-surface groundwater table. The main runway was built in 1950 of compacted gravel with bituminous surface seal. But the gravel was saturated most of the time.

Free water could be found wherever a piece of surfacing was removed. The surface broke up progressively, and by the summer of 1951 the port had to be closed to traffic so that repairs could be made. First efforts were unsuccessful, but by year-end, soil-cement came to the rescue.

The 41,000-sq yd of soil-cement processing on the runway, taxiway, and apron was completed in twelve working days. Successful hardening of the base resulted from mixing portland cement with the soft base material, even though unfavorable conditions of wet materials, early winter rains and subfreezing temperatures were encountered. This is a pronounced contrast to previous efforts to keep this base in a stable and usable condition.

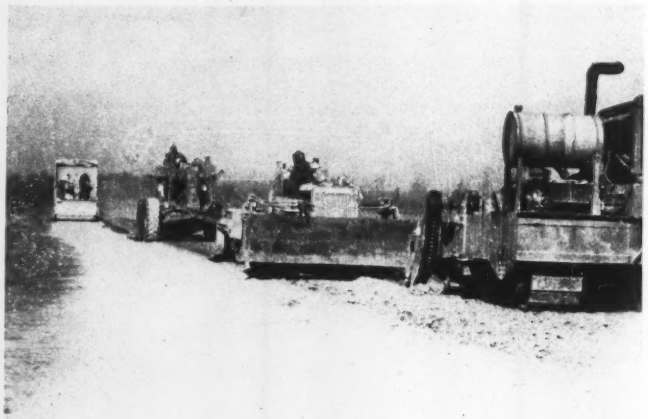
• The initial work—During original construction the airport was graded and local pit-run gravel was placed 14 in. thick on the apron, taxiway and two 400-ft long ends of the 3,615-ft by 100-ft northwest-southwest runway. The remainder of the runway had 12 in. of gravel.

Compaction was difficult during original base construction. Rains and the area's high water table made the material overwet, resulting in its movement under the rollers and under other loads.

To combat these compaction difficulties, areas were torn up and aerated in an attempt to dry the material before final compaction. All areas were given a bituminous surface seal of about ¾-in. thickness. The airport was opened in the summer of 1950, becoming a scheduled port for the Ozark Airlines.

Soon it was apparent that moisture from below had risen and again saturated the base. Free water lay immediately under the bituminous surface.

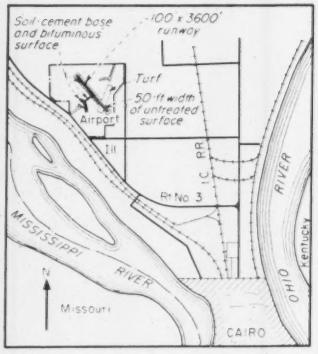
• Repair contract—In the summer of 1951 it was decided to place a 1½-in. hot-mix bituminous top on all areas. The port was closed to traffic and a contract for the work was let to the Bituminous Fuel and Oil Company of East St. Louis.



SOIL-CEMENT construction is a machine operation: (l. to r.) bulk cement spreader; scarifier on motor grader; tractor pulling rotary speedmixer; traveling roadmix machine.

General base softness indicated that it would be necessary first to make the base more solid. Aeration was tried again. The bituminous surface was cut into the top 5 in. of base; this mix was aerated and recompacted. The base then was given a 0.25 gal per sq yd bituminous shot to prepare it for receiving the 1½-in. bituminous hot-mix top application.

After the top had been placed on one-fourth of the runway, work was halted. Base softness still prevailed and the hot-mix could not be rolled out. Cracking, distortion, and subsidence occurred.



CAIRO AIRPORT is north of town, in bottom land between Mississippi and Ohio rivers. New base is in apron, taxiway and three-fourths of 3,600-ft main runway.

• Soil-cement adopted—Upon analyzing the situation, Illinois Department of Aeronautics engineers concluded that base reconstruction by the addition of portland cement was the solution. The cement addition would provide a drying action and lastingly harden the mass, even though complete compaction could not be obtained.

With the advice of Portland Cement Association engineers it was determined that the existing gravel material could be hardened satisfactorily with about 8% portland cement by volume of compacted material. This would equal one third sack per sq yd of 5½-in. depth.

A test section, 10 x 35 ft was built with the aid of local available equipment—a rotary speedmixer, motor grader, sheepsfoot roller, and steel-wheel roller.

Observations of the test section during the next few days showed the base to be hard and stable, so it was decided to proceed immediately with soil-cement treatment for all areas but the portion of the runway already covered with 1½-in. of hot top. Next summer a 1½-in. hot top will be placed over all the work.

The work was done on a cost-plus basis by Bituminous Fuel and Oil Co. The urgency of getting the airport open for commercial use as soon as

possible, and the uncertainty of weather conditions so late in the year made the cost-plus arrangement advisable.

• **Equipment**—Equipment initially obtained for the job consisted of:

1 Bulk-cement unloader (from railroad cars)
1 Bulk-cement spreader
1 Traveling mixing machine
2 Rotary speedmixers
1 Motor grader
1 Double-drum sheepsfott roller
1 Pneumatic tire roller
1 Tandem steel-wheel roller, 8 to 10 tons
3 Dump trucks for hauling cement
3 Tank trucks for hauling water
2 Rubber-tired tractors
1 Crawler tractor
1 Spike-tooth harrow
1 Light plant

After processing started it became apparent that another rotary speedmixer was needed, so it was obtained.

• **Construction procedure**—To avoid the saturating effects of rain and snow on scarified, unprocessed soil, cement for immediate operations was spread on the existing surface at a 10-ft width. The cement-covered surface was scarified, then the traveling mixing machine blended the cement into a 5½-in. depth of base, accomplishing partial breakdown of the fines. Two passes with a rotary speedmixer followed. Water then was applied by spray bars on the water trucks. About a gallon per sq yd was all that was needed, because the material was over the optimum moisture content in the undisturbed base. (Adding the water through the traveling machine was attempted, but a uniform mixture could not be obtained.)

On this job, moisture in excess of optimum was necessary because of a shortage of material passing No. 4 screen. (See table for soil characteristics.) The excess water overcame a tendency of coarse material to accumulate on top while fines settled to the bottom. If dry, the mix segregated seriously during mixing, the coarse material on top preventing formation of a dense surface. (Normally soil-cement is processed at optimum moisture).

After the water application, mixing with the rotary speedmixers continued until there was a thorough dispersion of the fines and a uniform incorporation of cement. This required two or three passes.

Then the sheepsfoot roller compacted the mixture until an inch and a half of loose material remained on the surface. The motor grader shaped the surface, after which it was pneumatic-tire rolled. Compaction planes near the surface were scratched with a spike-tooth harrow. Coarse material loosened by the harrow was drifted by the motor grader into the next process lane. This operation also leveled the surface mulch for final rolling. Any remaining areas of objectionable surface coarseness were sprayed heavily with water and immediately steel-wheel rolled. A small wave of slurry, pushed ahead of the rollers, combined with the pressure of the roller to form a satisfactorily bonded surface.

A bituminous seal coat of 0.2 gal per sq yd of RC-2 was applied to the soil-cement base in December and the airport opened to traffic. It is planned to put a 1½ in. hot-mix bituminous surface over the whole paved area next summer.

It was the consensus of interested groups that incorporation of the portland cement with the base has quickly and satisfactorily solved the serious base problem at the Cairo Municipal Airport.

• **Management** — This project was sponsored jointly by the Alexander County Airport Authority, the Illinois Department of Aeronautics and the Civil Aeronautics Administration. W. B. Ricks was construction engineer for the Illinois Department of Aeronautics; Ira Wall was engineer for the Alexander County Airport Authority and Jack Hall was superintendent for Bituminous Fuel and Oil Co., East St. Louis, Ill.

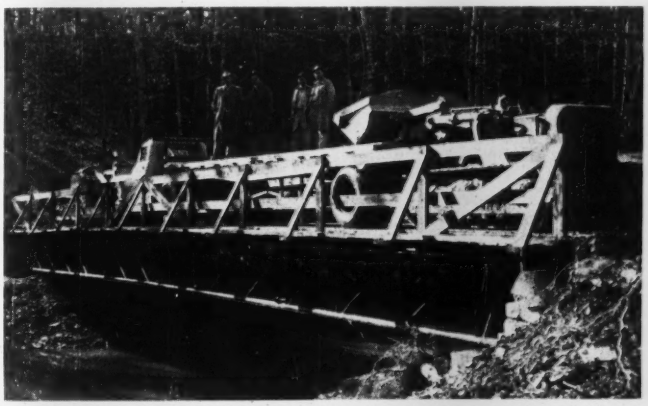
TEST CHARACTERISTICS OF BASE MATERIAL

Gradation	Ill. Dept. Aeronautics Specification	Passing Test No. 1 Per Cent
1 in.	100	94.7
¾ in.	80-100	80.4
½ in.	65-100	66.0
No. 4	40-60	41.9
No. 40	18-30	24.0
No. 200	5-10	10.7
Liquid limit	-	25.3
Plastic limit	-	14.0
Plastic index	2-8	11.3
Absorption		6.0
Bulk Specific Gravity		2.33
CBR (0.1 in. penetration) 57		
Max. Density (—No. 4) (lb/cu ft) 121.0		
Opt. Moisture (—No. 4) (Percent) 12.0		

FREEZING NOT HARMFUL

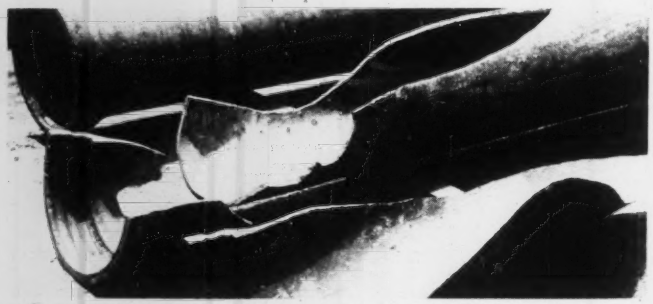
One of the hazards on the Cairo airport job was early-winter freezing. The unprotected surface of one day's work was damaged by an unexpected 16 deg F temperature. Next day, after the temperature rose above 32, the surface was watered and rolled. This recompacted the surface loosened by the freeze. Cement hydration is slow under such low temperature, so some additional working the day after placement is not as seriously detrimental as it is under higher temperature conditions.

During another freeze the surface was kept intact by covering it with 4 lb of straw per sq yd.



PIPE BRIDGE CONSERVES STEEL—To replace an old wood highway bridge on 22-ft spans over Little Alum Creek, Saline County, Ark., Bob Varner, Pine Bluff steel fabricator, and Saline County Judge Fred M. Kirkpatrick designed and built an 80-ft long welded truss bridge of reclaimed steel pipe. About 3½ ft deep, the five trusses composing the structure are said to be capable of carrying a total truck load of 40 tons safely. Varner says the bridge weighs about 50% less than a conventional steel-girder bridge and costs 30% less. He prefabricated the bridge in his shop and erected it for less than the cost of a timber replacement.

FIRST BREAK OF 1952 in Waikiki's troublesome water main produced this scene.



PIPE BREAK PATTERN has been standard in almost all 69 breaks suffered on the 16-in. water line. Splits start at nearly opposite points of the bell and converge toward the spigot end to a point 4 to 6 ft from the bell, breaking out a triangular section.

Water main with sulfur joints suffers its 69th baffling break

WHEN a 16-in. cast-iron water main burst early this year in the Waikiki tourist area of Honolulu, it hardly made news. The Honolulu Board of Water Supply just noted it as the 69th break in a 10,500-ft pipeline that has been giving trouble since 1938—10 years after it was laid.

The troublesome main is jointed with a sulfur compound, rather than lead used elsewhere in the system.

Sulfur-compound joints are self caulking, that is during the seating period the material expands to fill the joints tightly. Also they are less expensive than lead joints and have proved satisfactory in many U. S. areas. Yet, notably in Oakland, Calif., and Wichita, Kan., they have not.

Just why so many breaks have occurred in Honolulu still baffles the city's Board of Water Supply, which in 1947 appointed a special committee to investigate the problem. Study showed that most (but not all) of the breaks occurred where the pipe was at or below sea level.

The investigating committee has stated a tentative conclusion that the sulfur joint material undergoes a chemical change resulting in volume expansion creating hoop stress in the pipe bell. "The rate of chemical change," stated the committee, "is proportional to the degree of corrosiveness of the soil—primarily the amount of sea water in the soil."

The committee stressed that it feels more data will be needed. It first thought movement of the pipe through settling might be a factor, but more recently, members have come to doubt this since breaks have occurred where the line has a hard coral bed.

Thought has been given to replacing the entire troublesome line, but the expense of possibly $200,000 is a deterrent.

The board in replacing the joints and pipe as breaks occur has now replaced about half the 2-mile line originally laid with sulfur-compound joints.

Whether to dig up the rest still is under study.

• Research incomplete—Troubles with sulfur-compound joints got the official attention of the American Water Works Association back in 1946 when an investigation was ordered (ENR May 20, 1948, p 6). When by 1949 no conclusive research had been accomplished, the tentative AWWA specifications for cast-iron water mains were modified to include only lead and cement joints.

Lately, a research project has been undertaken by a manufacturer of sulfur compound (Atlas Mineral Products Co., Mertztown, Pa.). It is reported in the AWWA JOURNAL of December, 1951.

This report is called by its authors the result of just a small part of investigations contemplated on the subject. Yet it claims to clarify the problems of disintegration, stress and strain and corrosion of cast-iron pipe joints made with sulfur compounds.

Patent complications kept the investigators from going into other manufacturers' formulations. Instead, they strived to develop a formula of their own to meet federal specifications and to perform free from the above-mentioned problems. This, they claim to have done.

Tests on various compounds under varied conditions of pH and presence of NaCl led investigators to these findings and conclusions, as reported in the AWWA JOURNAL:

1. No reliable evidence has ever shown bacterial attack on sulfur joints in water lines. But just in case, investigators include 0.6% sodium silicofluoride as a bactericide in their "Atlas formula."

2. A compound with 2% sodium chloride suffered severe disintegration when buried for 12 months.

3. Stresses up to 10,000 psi have been reported in cast-iron pipe, and some have attributed these to sulfur-compound joints. The investigators conclude, however, from a one-month test of sulfur joints of their formula immersed in stagnant water, that the joints do not contribute to strain in cast-iron pipe.

4. On corrosion: Iron nails imbedded in Atlas-compound briquettes and immersed in salt and fresh waters with pH from 4 to 9 were unaffected in two years.

5. 268 of 771 known users of sulfur jointing compounds answered a questionnaire from which the investigators concluded: Trouble to date with sulfur joints is statistically insignificant—no greater than that encountered with other joints.

6. Sulfur cements should not be used in cast-iron pipe under conditions corrosive to cast-iron itself, nor in pH greater than 9.

7. Properly constructed sulfur joints may be used under all normal conditions—or about 90% of all pipelines.

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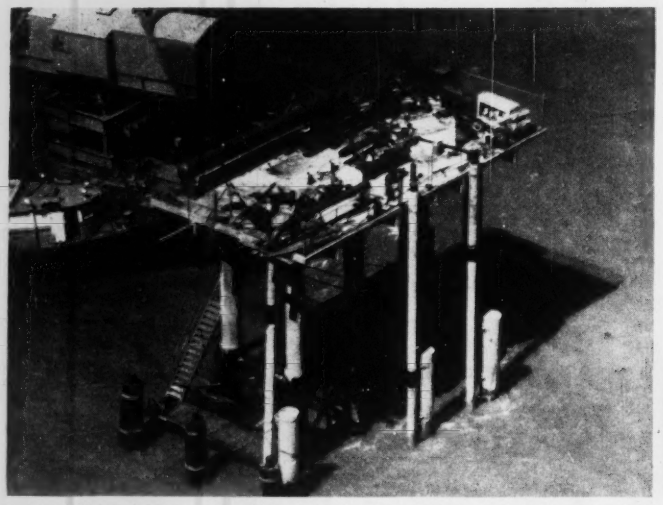
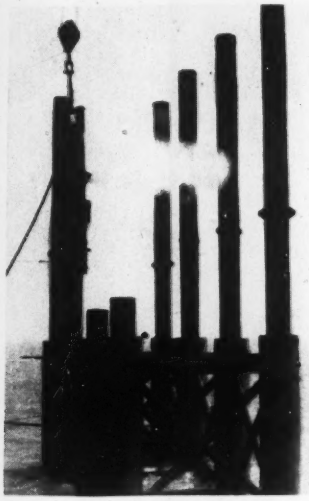


PILES 146 FT LONG support this platform, which will carry a natural-gas manifold and scrubber station 15 miles out in the Gulf of Mexico.



LOWER SECTIONS of composite piles are driven through guide frame.

Massive composite piles developed for offshore site

R. N. Crews
Asst. Chief Engineer
J. Ray McDermott & Co., Inc.
Harvey, La.

PRESTRESSING, which nowadays is likely to be the big news in any job where it is found, ranks second to a new application of the composite pile principle in this story.

These piles are 146 ft long. Driven to support a natural gas company's manifold and scrubber station 15 miles off the Louisiana Gulf Coast, they are composed of 24-in. steel-pipe lower sections 66 ft long, and 36-in. concrete-tube upper sections 80 ft long.

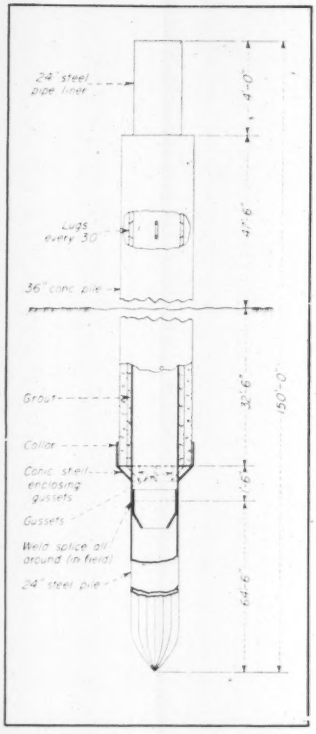
The concrete tubes are of the prestressed type described in ENR July 5, 1951, p. 38. In other offshore platforms the tubes have been used alone as piles. One of those piles is made up of 16-ft lengths of concrete pipe having longitudinal holes in the 4-in. walls. In assembly, the holes are lined up, then prestress is applied to wires in the holes. The holes are filled with grout. Used alone, the prestressed piles are driven open-end.

Site and dead-load conditions for the manifold and scrubber station would have required unduly long prestressed piles, great length being required to develop sufficient friction in soft bottom material. But water depth was such that an 80-ft length of 36-in. prestressed pile would provide enough resistance to horizontal forces from wind and waves. Its lower end would be below the theoretical point of fixity. Additional load bearing would be supplied by the more slender steel projection below concrete.

So the composite type was chosen. Of unprecedented size and makeup, the pile immediately introduced driving problems. The great length required field splicing of the component parts. But no practical way had been devised to splice the steel to the concrete so that driving stresses could be resisted.

The solution was to line the concrete pile with a 24-in. pipe. This liner projected 4 ft at the top to engage the driving hammer, and it projected at the bottom, for splicing to the over-all pile's steel portion. A steel collar near the liner's lower end acted as a shelf for the prestressed-concrete portion. The collar also acted as a seal for grout between concrete and the liner. Lugs on the liner centered it in the concrete pile. The liner also had a truncated cone welded to its lower end, to aid in stabbing the pile's upper portion to its lower portion. The splice was accomplished by weld-

(Continued on p. 67)



STEEL-PIPE LINER grouted in concrete upper section transmits driving stress to lower section. Lugs on liner center it within the 36-in. prestressed concrete section. Concrete rests on collar.

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It illustrates once again that accurate fabrication not only saves time on the job but cuts erecting costs in the field!

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December 6, 1951

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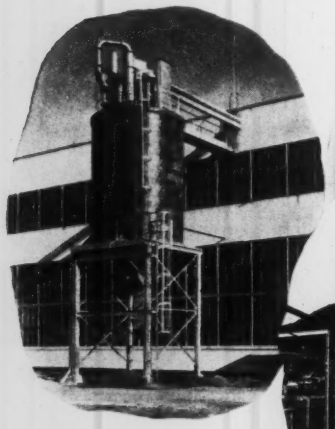
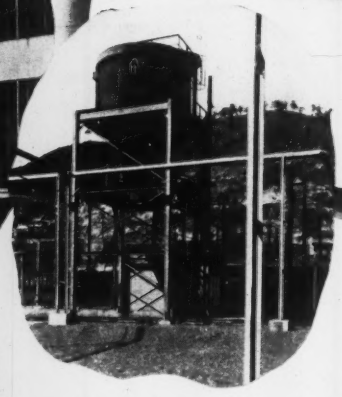
We look forward to continuing our past pleasant relationship.

Yours very truly,
UNITED CONVEYOR CORPORATION

BY E. L. Becker
E. L. Becker
Purchasing Agent





These photographs show (at left) a NUVEYOR Pneumatic System that handles boiler ash from finest dust to heaviest clinkers; and (to right) an ash sluicing system that is hydraulically operated, so that commercially dry ashes are discharged into railroad cars with a minimum of labor, and cost.

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Fabricators of Steel for Industry

(Continued from p. 64)
ing the liner-lower portion joint.

Before driving, the pile's concrete portion was assembled in a horizontal position. To make the grouting effective a rubber gasket was clamped around the seat to seal the lower end and a pneumatic type seal was used at the upper end. An oil well cementing unit did the grouting.

At the site a driving templet was placed, the steel pile sections being driven through it as illustrated. Then the concrete pile was stabbed onto the steel, the splice was made and the driving continued to grade.

Two other pile elements were part of the job. Plain prestressed concrete piles were driven, filled with sand and capped with concrete to act as gas-pipe riser supports. And wood-pile dolphins were installed for mooring and fendering service vessels.

The platform, precast in two sections and complete with chain link fence, was brought from shore and secured to the composite piles' tops.

Owner is United Gas Pipe Line Co. General contractor was J. Ray McDermott & Co., Inc., Harvey, La. Prestressed concrete piles were furnished by Raymond Concrete Pile Co.

Notes on legal decisions

Summaries of decisions relating to construction work prepared by I. Vernon Werbin, counselor at law and engineer, New York, author of Legal Phases of Construction Contracts (McGraw-Hill Book Co.)

Right of an architect to modify owner's contract

A contractor entered into a contract to make certain repairs and alterations in a building in accordance with plans and specifications prepared by a designated architect.

After the contractor had started the performance of the work covered by the contract, he was directed to do some additional work on the basis of day labor. Because of difficulty in keeping a correct record of the workmen's time, some of whom were doing the contract work while others were working on the day labor basis, he suggested to the architect that all the work be done on a time basis. Later, the contractor claimed that the architect told him that he would take the matter up with the owner, and that on the next day the architect told the foreman that he had taken the matter up with the owner and that the owner said "it was agreeable to him to turn everything into day's work and cut out the contract." Neither the contractor nor his foreman claimed to have had any conversation with the owner on the subject, even though the owner was about the building frequently. The architect denied that he ever took the matter up with the owner or that he had ever told the contractor's foreman that the owner had consented to a change in the contract.

The court held that the proof offered of the owner authorizing the architect to change the contract was unsatisfactory and that the contractor's rights were limited to the terms of the original contract.

The court in its opinion stated: "The fact that Jones was the architect employed by the defendant [owner] to draw plans and specifications under which the work was to be done, and engaged to superintend the work and see that it was performed in compliance with such plans and specifications, conferred upon him no implied power to change the contract. Such power was wholly beyond the scope of the agency. It would be a dangerous proposition to hold that the employment of one as an architect and superintendent of construction of a building conferred upon him by implication the authority to change, modify, or alter the contracts entered into between the owner and the contractor."[1]

(1) Brown v Coffee, 121 P. 309.

Breach of a contract

In an action to recover damages for breach of a contract to bring a plot of land to specified levels and to fill in certain depressions so as to bring the land up to the required grade, the owner of the land was held to be entitled to recover as damages for breach of the contract, either the reasonable cost of bringing the property to the required grade and filling in the depressions, or the difference between the fair market value of the land as actually graded and the fair market value of the land when graded to the elevations specified in the contract, whichever was lower.[1]

(1) Dimick v Noonan, 242 S.W. 2d 592 (Kansas City Court of Appeals, Oct. 1, 1951.)

In another case[1] a subcontractor brought action to recover damages for breach of an oral contract to do lathing and plastering work under a building contract between the general contractor and the City of Atlanta. There the subcontractor had agreed to comply with all the conditions of the general contract. However, before the subcontract was entered into, the general contractor had made certain representations to the subcontractor as to the way the work was to be done, and in reliance upon these representations the subcontract was entered into.

After the subcontractor had started the work and had ordered needed materials he was ordered to discontinue the work because the method in which it was agreed that the work was to be done was in conflict with the specifications.

The architect who was employed to supervise the work insisted that the general contractor make an adjustment in the work. The subcontractor was directed to discontinue the work until this matter was straightened out. The subcontractor, thereupon temporarily withdrew his men from the job. Shortly thereafter he went to the job to see if an agreement had been reached as to the corrections to be made in the work only to discover that the general contractor was completing the work with his own forces. The subcontractor then brought the action to recover damages for breach of the contract.

The court allowed the subcontractor a recovery for the difference between the contract price and the cost to complete the work plus what he had already expended on the work.

(1) Herrman v Conway, 65 S.E. 2d 41, 83 Ga. App. 888 (Court of Appeals of Georgia, May 4, 1951.)

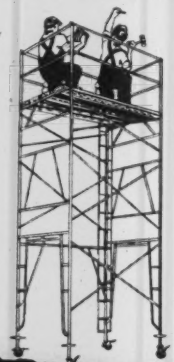
Implied warranty of plans made by qualified person

"It seems to be well settled that where a person holds himself out as specially qualified to perform work of a particular character, there is an implied warranty that the work which he undertakes shall be of proper workmanship and reasonable fitness for its intended use, and, if a party furnishes specifications and plans for a contractor to follow in a construction job, he thereby impliedly warrants their sufficiency for the purpose in view."[1]

These principles have been applied to building contracts.[2] Also, see Avent v. Proffitt, 190 S.C. 48, 95 S.E. 134, where an architect was held liable for failure to discover and condemn defective plastering in a house erected under his supervision."[3]

(1) 17 C. J. S., Contracts, Section 329, page 781.
(2) Monmount Realty Co., Inc. v. Ballentine, 111 N. J. Eq. 398, 162A. 594, General Fireproofing Co. v. L. Wallace & Son, 8 Cir., 175 F. 650. Kennedy v. Bowling, 319 Mo. 401, 4 S. W. 2d 438.
(3) Hill v. Polar Pantries, 64 S. E. 2d 885, Supreme Court of South Carolina, April 30, 1951.

Safety is no Accident!



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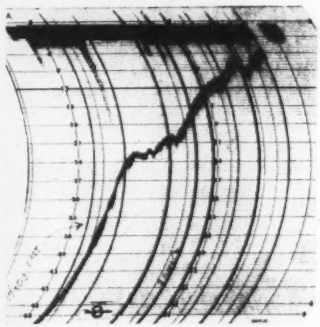

DEPTH RECORDER took cross-section like this to establish boundary's location.

Electronic depth recorder determines state boundary

Three-fourths of the cost of an ordinary hydrographic survey was saved with an electronic depth recorder when a portion of the state boundary between Illinois and Kentucky was established recently. This unusual survey was made by the Vollmar Bros. Construction Company of St. Louis, Missouri, for Ebasco Services, Inc. of New York.

Contrary to the usual practice of establishing a common state boundary in the middle of the river, the state of Kentucky, apparently upon its admission into the Union, annexed the Ohio River and established her boundary on the Illinois shore.

The segment of boundary in question was about 1200 feet long, located 30 miles up the Ohio river from its mouth. On the Illinois bank at this site, a 625,000 KW steam power plant is to be erected for Electric Energy, Inc.

The boundary had to be determined in order to fix the location of the marine dock and coal handling facilities for the power plant, and to survey accurately the plant's property lines. The state line at this site is defined as a contour line on the Illinois shore 284.3 feet above mean sea level. This level evidently was the low water mark of 1873.

A topographic map of the river bottom was compiled by running river-bottom cross sections at 75-ft intervals normal to the shore. The instrument used for this surveying project was the Bendix DR-8A Depth Recorder.

With this instrument it was possible to survey 28 acres in 3 days of field work. This is a saving of 75% of the time that would have been required had the job been done by the less accurate lead-line methods—Joseph E. Vollmar, Jr., St. Louis, Mo.

AUTOMATIC ROOFING—To roof 113,000 sq ft of the Gerber Products Co. warehouse in Rochester, N. Y., Central City Roofing Co. pumped pitch to a tank on the roof, which fed mechanical spreaders. The spreaders covered the 2-in. thick cellular-glass insulation on the roof deck with the pitch as it rolled out the felt. A workman followed with a brush to work out air bubbles. Pittsburgh Corning Corp. photo.

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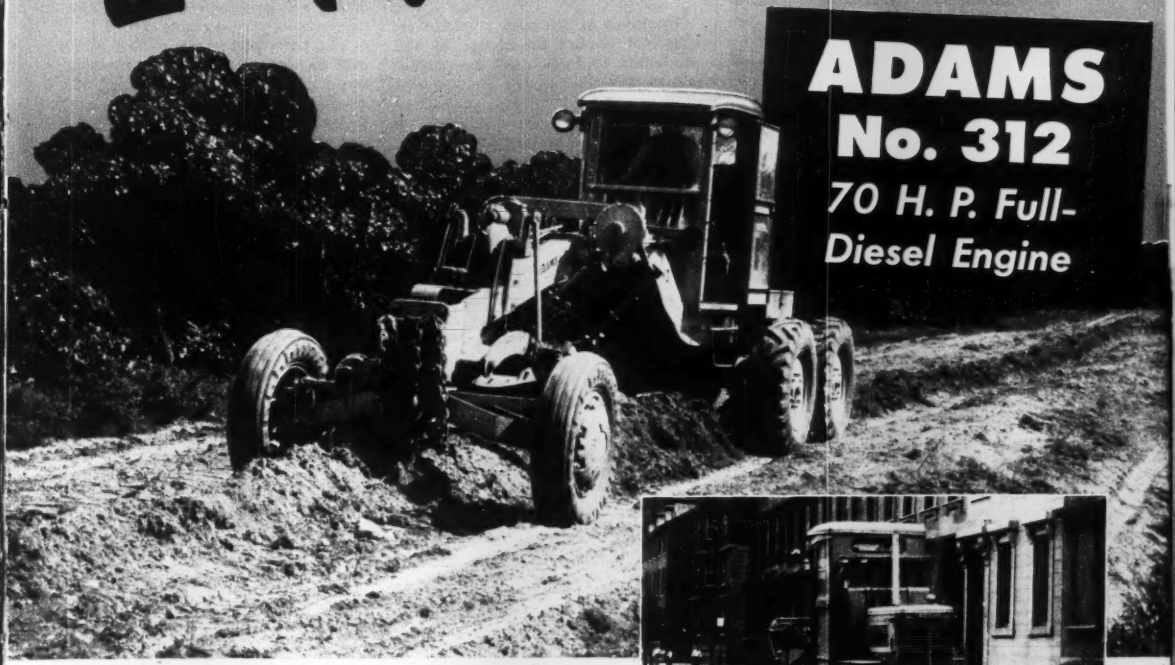

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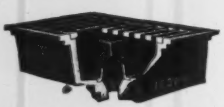

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REVIEWS OF NEW BOOKS

Practical soil mechanics

SOIL MECHANICS, FOUNDATIONS, AND EARTH STRUCTURES—By Gregory P. Tschebotarioff. 655 pp. McGraw-Hill Book Co., New York 36, N. Y. $6.50.

Emphasis in this book is on the relation of present knowledge of soil mechanics to foundation design and construction and to the construction of earth dams. A large amount of space is given to earth pressures on walls, bulkheads and cofferdams, and to the stability of slopes.

The essentials of the theory of soil mechanics are covered in the opening chapter of the book to the extent necessary for a text of this kind. In the chapters devoted to the application of theory to various types of work, the author draws freely on practical experience. For that reason the book should prove useful to practicing engineers.

The effect of engineering on western civilization

ENGINEERING AND CIVILIZATION — By James Kip Finch. 397 pp. McGraw-Hill Book Co., New York 36, and London. $5.00.

James K. Finch of Columbia University's School of Engineering has long been a student of engineering in ancient times. Thus he has developed a broad background for this study of the place of engineering in western civilization.

Against this background, Dean Finch has sketched the contributions of engineering to the progress of the human race. These sketches begin with the earliest known engineering works of Egypt, Rome and Greece, and come forward through the Middle Ages and the Renaissance to the period of the great French engineers and then to early British engineering.

Of this latter period he says: "With the rise of engineering in Britain in the 18th century an entirely new era in human history came into being. . . . For almost the first time in history engineering became allied not with government but with private practice, and its methods and practices were extended into and, to a major extent, created the great field of modern industrial production of consumers' goods."

Most of the book is devoted to a discussion of engineering's place in the industrial revolution which began in that century. Modern engineering is treated as it was applied to meeting the need for transportation, power, new materials, expanding industry, communication and construction. In these chapters Dean Finch has done a splendid job of selecting only what appear to him to be the significant events and weaving them into a continuous and very readable record.

The latter part of the book is given over to short discussions of the relationships that "must be clarified and developed if the Western World is to meet successfully. . . . the burdens and opportunities, the challenge, it faces today." These cover such subjects as mass production and employment, distribution of technological gains, the effect of technological changes on capital goods and the place of engineering in research.

The most refreshing aspect of this book is its modesty. Dean Finch does not look upon engineers as supermen who can solve all the world's problems. "This volume," Dean Finch says, "attributes the ever increasing power and importance of engineering in the Western World not to a few men but to the fact that many men of less than extraordinary gifts can and have made worthwhile contributions to the ever accumulating mass of knowledge from which engineering power and progress stem."

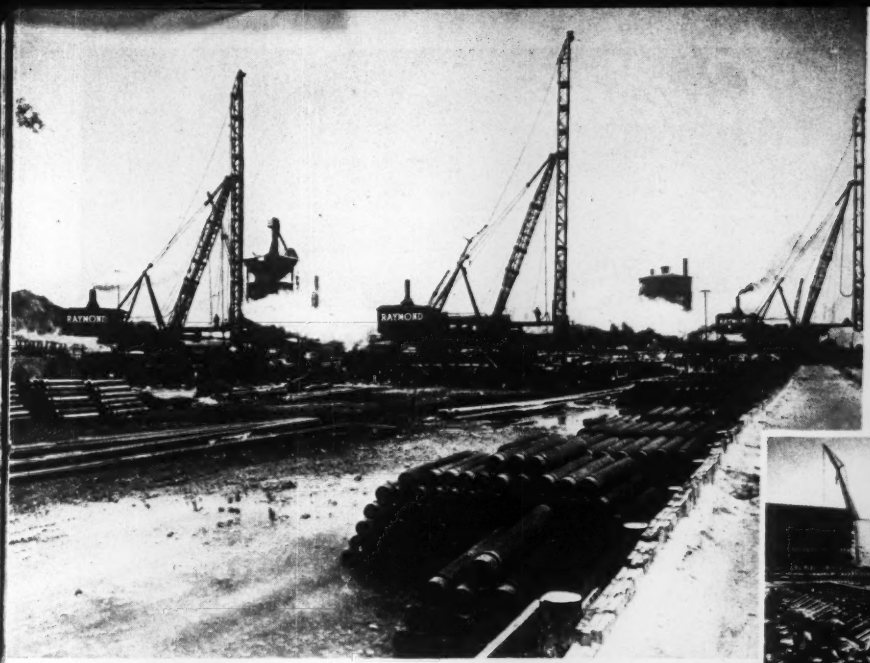
Modesty does not, however, keep him from adding that the engineer "has successfully dared to meet current problems by building greater works, often without full and complete knowledge on which to base designs. . . . Arch bridges were built before we thoroughly understood the mechanics of the arch, dams before we knew with any quantitive certainty how they acted, truss bridges came before truss analysis, reinforced concrete antidated the theory of concrete design, even the steam engine came before the modern theory of heat. The 20th Century has been preeminently an era in which theory has been catching up with practice, certainly in the field of civil engineering."

German Text on tunnels

TUNNELBAUGEOLOGIE — By Josef Stini. 366 pp. Published by Springer-Verlag, Vienna, Austria. $8.80. Obtainable through Stechart-Hafner, Inc., 31 East 10th St., New York.

It is an indication of the changing place of geology in civil engineering work that there is now available such a comprehensive book as this dealing with the application of geological

(*Continued on p. 73*)



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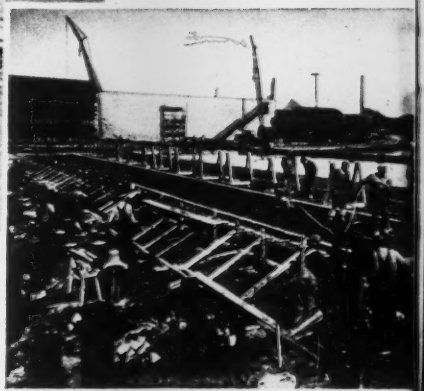

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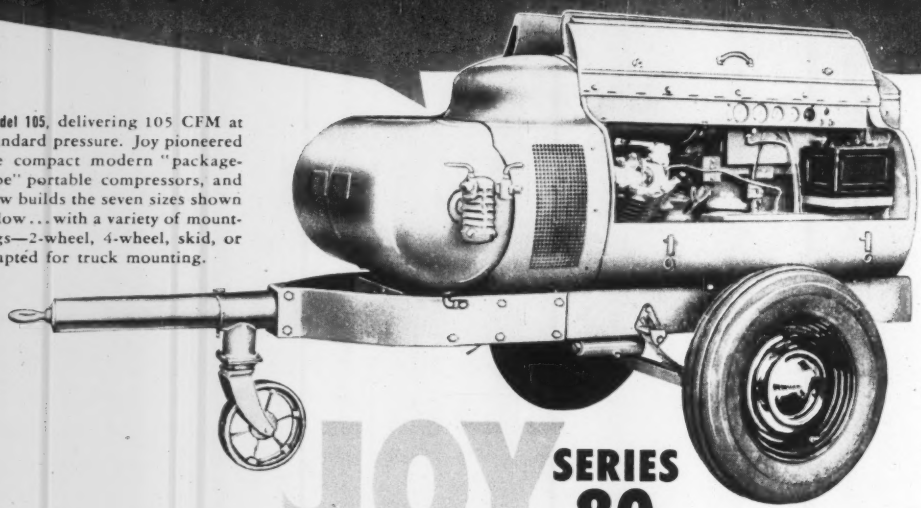

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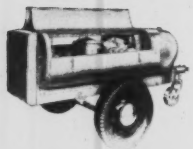
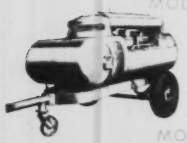


MODEL 60



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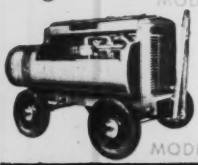

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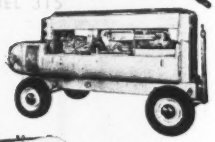

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(Continued from p. 70)

methods and principles to the design and construction of tunnels alone. The volume is a good example of the thorough treatments of technical subjects from the famous publishing house of Springer, to which engineers were accustomed before 1939. About 200 tunnels are used as examples (including not a few from North America). All the main geological features and peculiarities which can affect tunnel work are discussed, in every case with a comprehensive bibliography attached.

A knowledge of the German language is necessary for full appreciation of the book, but the excellent diagrams and the many references to papers and books in English render the volume of general interest to those who read only English and yet are anxious to study the art of tunneling—REVIEW BY R. F. LEGGET.

Prestressed concrete

BETON PRECONTRAINT—By Y. Guyon. 702 pp. Published by Editions Eyrolles, 61 Boulevard St. Germain, Paris V, France. 4,500 Fr. Obtainable through Stechart-Hafner, Inc, 31 East 10th St, New York 3.

This extensive volume can probably be regarded as the complete presentation of all design theory and methods on the prestressed concrete process in France. This also means that it reflects the art as developed by E. Freyssinet, the earliest and still the most active proponent of the art. M. Guyon, the author, was a student and colleague of M. Freyssinet, who has written the preface endorsing the contents of the book.

Readers of this review should note that the book under discussion is written in French.

Notes on Pamphlets, Reprints and Educational Films

• **Fluoridation of Public Water Supplies** has been made the subject of a reference list compiled by the Municipal Reference Library of the Detroit Public Library, 1705 Water Board Building, Detroit 26, Mich. Copies are free as long as the supply lasts.

• **Water Pollution Studies** of various river basins in this country are being compiled by the Public Health Service in cooperation with interested state agencies. Recent issues are: No. 4, Great Basin; No. 5, California; No. 6, Pacific Northwest; No. 7, New England; No. 9, Colorado River; No. 10, North Atlantic; No. 11, Lake Erie. Copies can be obtained from the Public Health Service, Federal Security Agency, Washington 25, D. C.

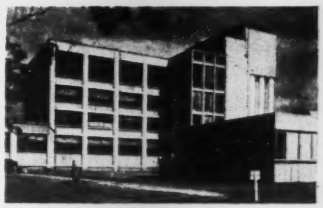
• **The Fire Hazards of Supermarkets** and methods of protection are the subjects of a pamphlet issued by the Pacific Fire Rating Bureau, 465 California St., San Francisco 4, Calif. Single copies are free.

• **Calculation of Water Pollution**, three papers by Gunnar Akerlindh, have been published (in English) by the Limnological Institute of the University of Lund, Sweden. They are "Proportionality in Pollution"; "Permissible Pollution at Combined Sewer Overflows"; and "A Method for Computing the Necessary Amount of Storm Weather Flow in a Combined Sewer System to be Diverted for Disposal when Discharging the Surplus into a Stream."

• **Sanitary engineering studies**—The two initial sanitary engineering studies of a series started by the University of Illinois cover (1) diatomite filter effectiveness in taking radioactive phosphorus from water and (2) high-oxygen atmosphere in activated sludge. In the work on filtering out radioactive phosphorus, it was found that diatomaceous earth alone does not permit very good removals. Adsorption to activated carbon first increases effectiveness. In the second study—on oxygen-enriched atmosphere in the A-S process—it is concluded that this is economically unjustifiable, even if otherwise effective. And effectiveness was not established in the study. Copies may be obtained from the university's Department of Civil Engineering at Urbana, Ill.

• **Community planning**—The Urban Land Institute has packed into its Technical Bulletin No. 16 enough advice to get any town planner started in the right direction. The bulletin is at the same time a check-list of problems that will be encountered in originating new industrial towns and a manual of general solutions. It pays particular attention to the characteristics of the population that is likely to live in a new community (percentage of age-groups, primary and secondary workers, marital status, etc.) and to the types of construction that will meet the population needs. Entitled "Planning Community Facilities for Basic Employment Expansion," is available for $3.00 from the Urban Land Institute, 1737K St. N. W., Washington 6, D. C.

• **Compressed Air Power in Construction** is a 21-page pamphlet intended primarily for students of construc-



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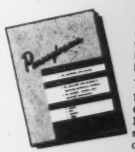

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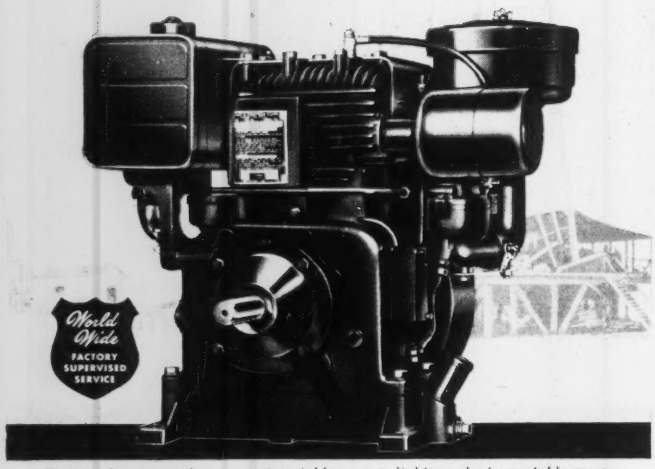

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New Engineering Books

GRAPHIC AIDS IN ENGINEERING COMPUTATION—Randolph P. Hoelscher, Joseph Norman Arnold, and Stanley H. Pierce. 197 pp. McGraw-Hill Book Co., New York 36, Toronto and London. $4.50.

ALCOA AN AMERICAN ENTERPRISE—By Charles C. Carr. 292 pp. Rinehart & Co., New York and Toronto. $3.50.

STUDIES IN LARGE PLASTIC FLOW AND FRACTURE—By P. W. Bridgman. 362 pp. McGraw-Hill Book Co., New York 36, Toronto and London. $8.00.

THE MAKING, SHAPING AND TREATING OF STEEL—Sixth Edition. By J. M. Camp and C. B. Francis. 1,584 pp. United States Steel Co., Pittsburgh, Pa.

THE RESISTANCE OF PILES TO PENETRATION—By Russell V. Allen. E. & F. N. Spon Ltd. 22, Henrietta St., London, W.C.2. 126 pp. Price 21s.

BUCKLING STRENGH OF METAL STRUCTURES—By Friedrich Bleich. 508 pp. McGraw-Hill Book Co., New York 36, Toronto and London. $10.00.

NOMOGRAPHY AND EMPIRICAL EQUATIONS—By Lee H. Johnson. 150 pp. John Wiley & Sons, New York 16, Chapman & Hall, London. $3.75.

FLUID FLOW IN PIPES—By Clifford McClain. 123 pp. The Industrial Press 148 Lafayette St., New York. $3.00.

THE TECHNIQUE OF CLEAR WRITING—By Robert Gunning. 289 pp. McGraw-Hill Book Co., New York 36, Toronto and London. $3.50.

WATER TREATMENT FOR INDUSTRIAL AND OTHER USES—By Eskel Nordell. 526 pp. Reinhold Publishing Corp., New York 36. $10.00.

HOW TO SUPERVISE PEOPLE—Third Edition. By Alfred M. Cooper. 254 pp. McGraw-Hill Book Co., New York 36, Toronto, London. $3.75.

PLANE TABLE MAPPING—By Julian W. Low. 363 pp. Harper & Brother, New York 16, N. Y. $4.50.

(Continued on p. 76)

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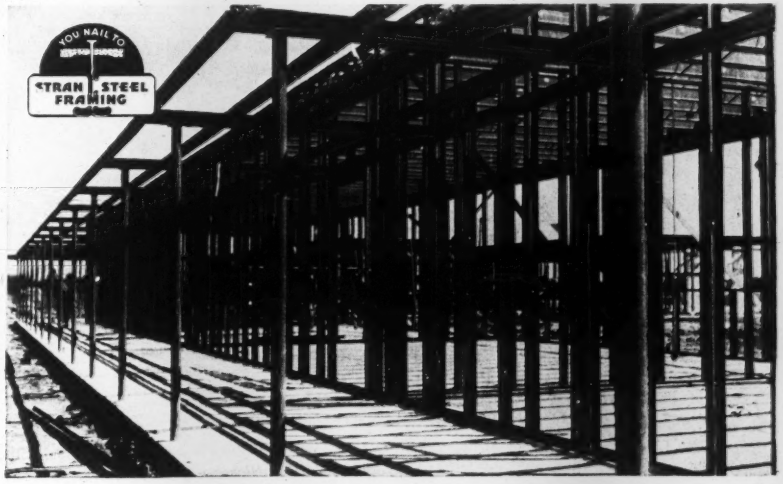

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(Continued from p. 74)

RIGID FRAME FORMULAS—By A. Kleinlogel. 460 pp. A translation of the 11th edition of "Rahmenformicen". Frederick Ungar Publishing Co., New York, $10.00.

THE RISE OF THE SKYSCRAPER—By Carl W. Condit. 255 pp. The University of Chicago Press, 5750 Ellis Avenue, Chicago 37, Ill., $5.00.

SHORT CUTS IN CONCRETE & STEEL DESIGN—By Fred C. Whitney. 84 pp. Fred C. Whitney, 16502 Ward Ave., Detroit 35, Michigan. $3.50.

SPECIFICATIONS AND COSTS—By Elwyn E. Seelye. 506 pp. John Wiley & Sons, New York 16, Chapman & Hall, London. $13.00.

DATA BOOK FOR CIVIL ENGINEERS DESIGN—By Elwyn E. Seelye. John Wiley & Sons, New York 16, Chapman & Hall, London. $10.00.

INDUSTRIAL BUILDINGS—By Kenneth Reid. 541 pp. F. W. Dodge Corporation, New York 18, N. Y. $9.00.

ARCHITECTURAL & ENGINEERING LAW—By Bernard Thomson. 424 pp. Reinhold Publishing Corp., New York 36, N. Y. $7.00.

IRRIGATION OUTLETS—By N. D. Gulhati. 784 pp. Atma Ram & Sons, Kashmere Gate, Delhi, India. $2.65.

THE UNITED STATES PUBLIC HEALTH SERVICE—By Ralph Chester Williams, M.D. 890 pp. Commissioned Officers Association of the United States Public Health Service, Box 5874, Bethesda, Md.

FINAL REPORT OF THE SCHUYLKILL RIVER PROJECT ENGINEERS—181 pp. Published by Water and Power Resources Board, Department of Forests and Waters, Commonwealth of Pennsylvania, Harrisburg, Pa.

Reports and Pamphlets

PRESENT ECONOMIC AND TECHNICAL STATUS OF WATER RECLAMATION FROM SEWAGE AND INDUSTRIAL WASTES—Technical Bulletin No. 4, Sanitary Engineering Research Project, University of California, Berkeley, Calif.

PERFORMANCE OF AIRPORT PAVEMENTS—Technical Bulletin No. 175, American Road Builders' Association, International Building, Washington 4, D. C. 25¢.

EXPRESSWAYS TO AIRPORTS VITAL TO CIVIL DEFENSE—Technical Bulletin

(Continued on p. 80)

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LOOK ***at this record!*** After more than 12 years and 2½ million yards of hard digging, this 1½-yard Lorain-79 shovel *is still at work* for R. A. Wade & Co., Bessemer, Ala.

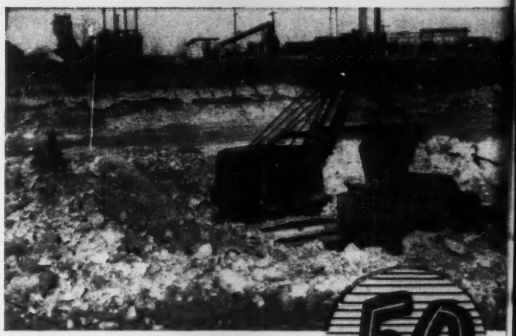
LOOK ***at that quarry!*** It's 200 ft. deep and millions of yards of tough dolomite limestone have been dug from it by this Lorain to feed blast furnaces in Birmingham. Surely, here's a job that calls for the best in shovels.

LOOK ***at the Lorain!*** It's still digging rock—still in good working condition. In 1939, as now, Lorains were built to break records in rock—proof of Lorain quality, stamina and endurance in the toughest kind of digging.

LOOK ***at the results!*** Imagine the earning power of this veteran Lorain . . . the profits it has paid . . . the satisfaction it has given its owner. These are reasons why R. A. Wade & Co. have 3 Lorains—why they bought the new Lorain-50 shown at the right!

• *Ask your Thew-Lorain Distributor for more proof of Lorain performance records!*

THEW LORAIN



NOW LOOK AT THE NEW 50

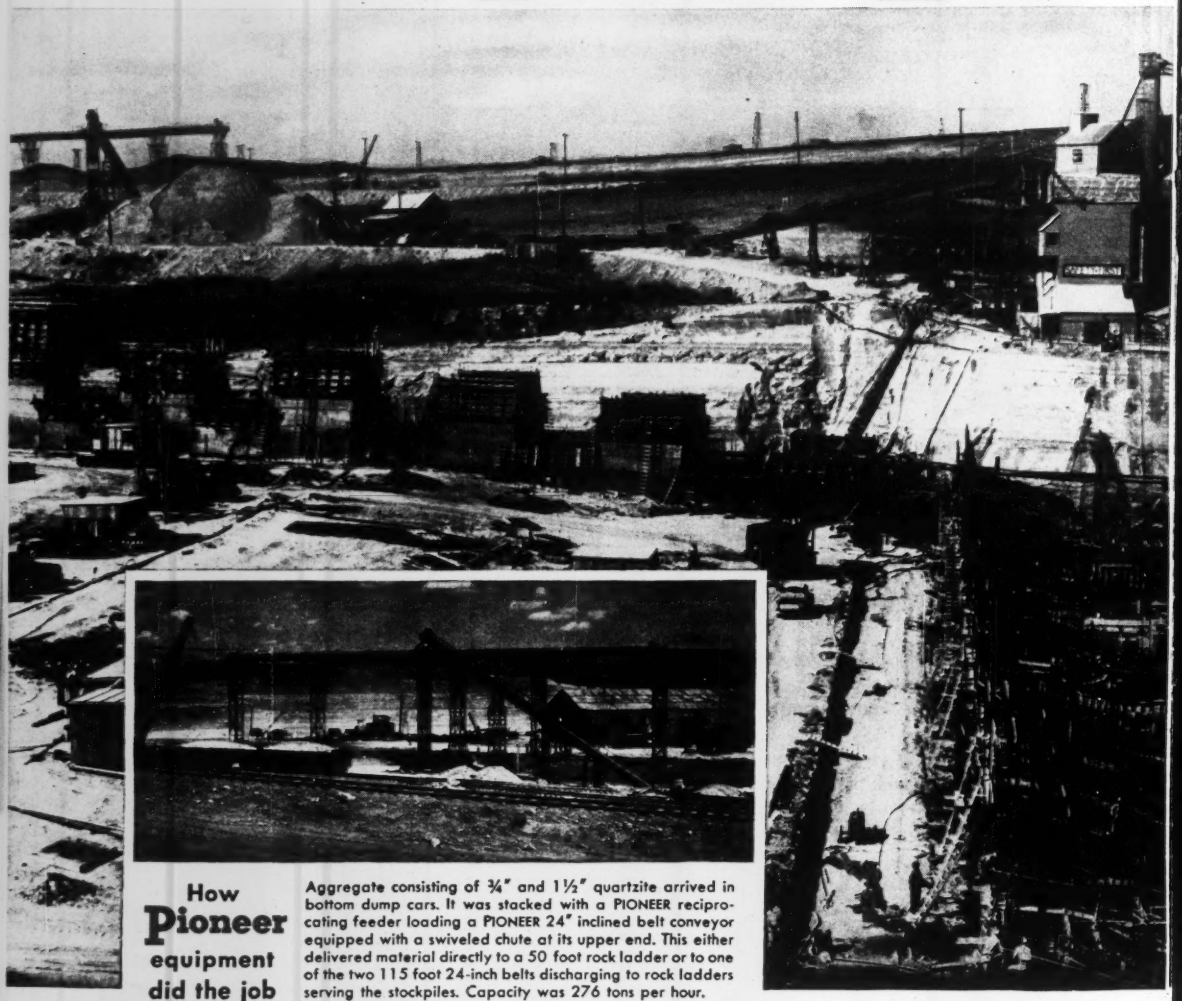
This is Wade's newest Lorain.

They've just opened a new quarry and Lorain again is the choice. This time it is a 1-yd. Lorain-50. Equipped with shock-absorbing hydraulic (fluid drive) coupling, air assist on crowd, retract and hoist controls—air steer and tread lock—plus many other new and modern features — the Lorain-50 — today's newest Lorain—is built to surpass even the amazing records of previous Lorain models—some still on the job after a quarter of a century or more!

THE THEW SHOVEL CO., LORAIN, OHIO

When economy is vitally important...

that Pioneer Edge



How Pioneer equipment did the job

Aggregate consisting of ¾" and 1½" quartzite arrived in bottom dump cars. It was stacked with a PIONEER reciprocating feeder loading a PIONEER 24" inclined belt conveyor equipped with a swiveled chute at its upper end. This either delivered material directly to a 50 foot rock ladder or to one of the two 115 foot 24-inch belts discharging to rock ladders serving the stockpiles. Capacity was 276 tons per hour.

Three gates under each stockpile delivered aggregate to an 18-inch belt which carried it by an underground-overground conveyor to the batch plant 835 feet away.

BUY BOTH!
HIGHER OUTPUT
LOWER UPKEEP

Pioneer

Continuflo EQUIPMENT

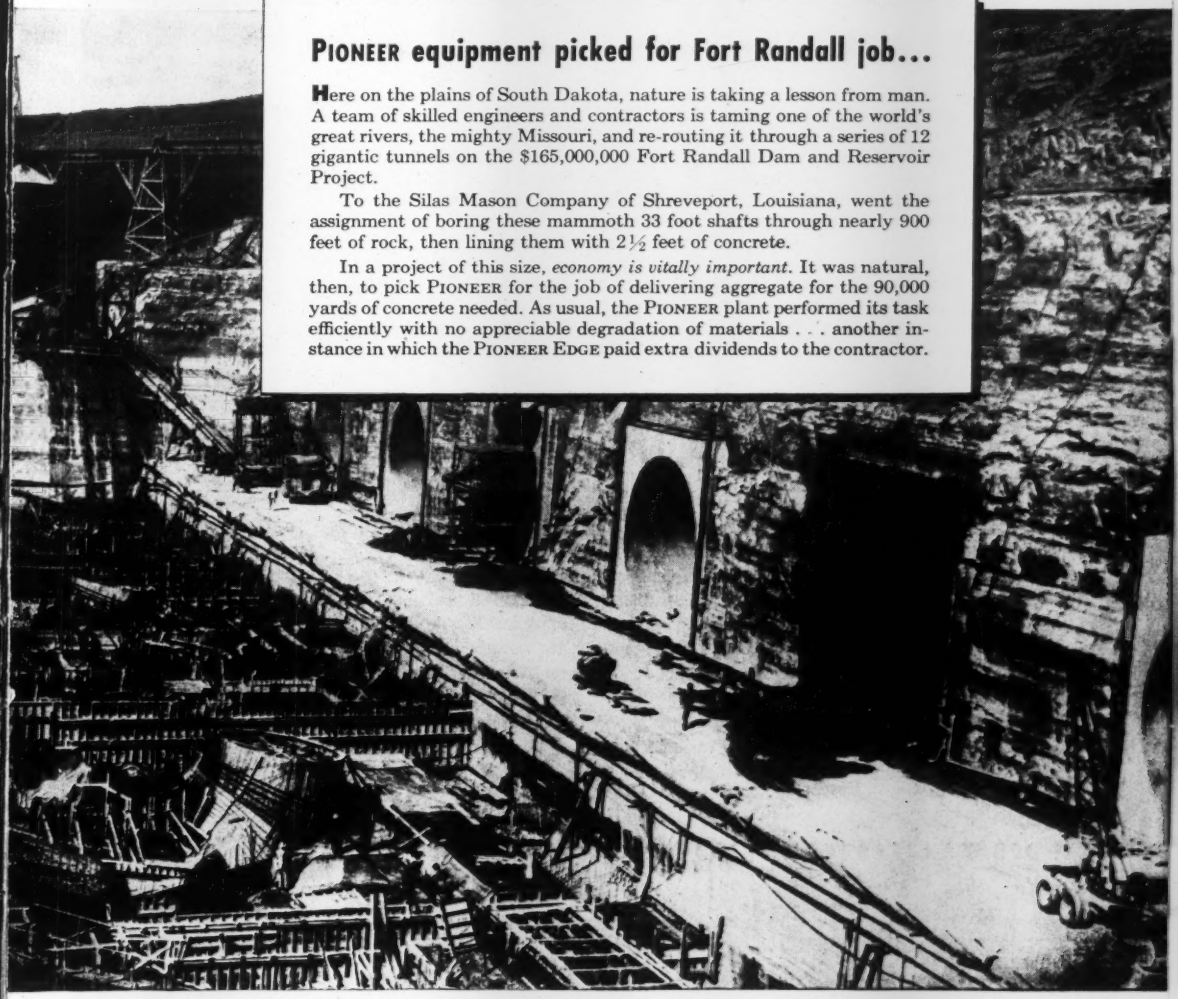
means rock bottom costs

PIONEER equipment picked for Fort Randall job...

Here on the plains of South Dakota, nature is taking a lesson from man. A team of skilled engineers and contractors is taming one of the world's great rivers, the mighty Missouri, and re-routing it through a series of 12 gigantic tunnels on the $165,000,000 Fort Randall Dam and Reservoir Project.

To the Silas Mason Company of Shreveport, Louisiana, went the assignment of boring these mammoth 33 foot shafts through nearly 900 feet of rock, then lining them with 2½ feet of concrete.

In a project of this size, *economy is vitally important*. It was natural, then, to pick PIONEER for the job of delivering aggregate for the 90,000 yards of concrete needed. As usual, the PIONEER plant performed its task efficiently with no appreciable degradation of materials . . . another instance in which the PIONEER EDGE paid extra dividends to the contractor.



What the Pioneer Edge *meant to Silas Mason*

At Fort Randall, PIONEER equipment again showed its exceptional capacity for efficient, low cost handling of sand and aggregate. Especially important was the fact that it eliminated breakage of materials and made it readily possible to adhere to strict government specifications.

"The system functioned economically and we were well satisfied with its performance," reports R. B. Jewell, Silas Mason's Resident Engineer in charge of the project.

PIONEER ENGINEERING WORKS
1515 Central Avenue • Minneapolis 13, Minnesota
SUBSIDIARY OF POOR & COMPANY, CHICAGO

● Please send me information on the equipment checked.

☐ CONTINUFLO CONVEYORS	☐ GRAVEL PLANTS	☐ WASHING PLANTS
☐ MECHANICAL FEEDERS	☐ ROCK PLANTS	☐ BITUMINOUS PLANTS
☐ VIBRATING SCREENS	☐ JAW CRUSHERS	☐ APRON FEEDERS
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*Company*_____

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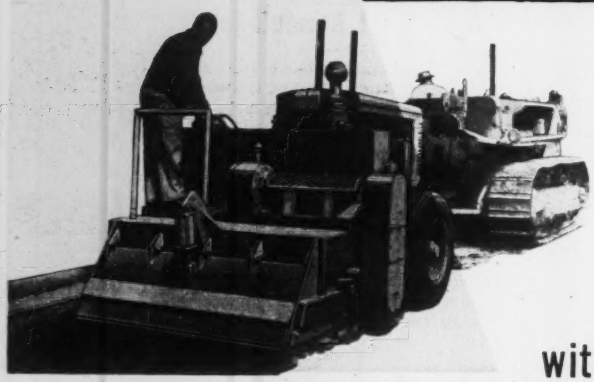
*City*_____ *Zone*____ *State*_____

You Can Reclaim Old Pavements for 100% Re-use



with a WOOD PREPARIZER

It Scarifies • It Pulverizes • It Prepares

In one operation, the Wood P-600 Preparizer will scarify, pulverize and prepare old asphalt or macadam into select aggregate for 100% re-use. Nothing is lost. Even the old oil is retained. It takes up to a 3 to 6 inch cut in asphalt pavement, prepares as much as a mile per day on a 22 ft. pavement. Used for soil blending, it takes up to an 8-inch cut, prepares as much as 1000 cu. yds. per hour.

Diesel-powered, and towed by a D-7 tractor or equivalent, the Wood P-600 Preparizer is designed specifically for this kind of work. It's a contractor's tool —not a converted piece of agricultural equipment.

For literature and prices on the Wood Preparizer, Wood Roadmixers and Wood Roadbuilding Equipment, see your Wood distributor or write us direct.

ROADBUILDING EQUIPMENT

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Export Offices: 3938 Wilshire Blvd. • Los Angles 5, Calif. • Cable Address: Woodor

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NEW CONSTRUCTION AND REPAIRS

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- Dam Reconstructing and Repairs
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SPRAGUE & HENWOOD, Inc.
Dept. E, Scranton 2, Penna.

(Continued from p. 76)

No. 176, American Road Builders' Association, International Building, Washington 4, D. C. 25¢.

THE ROLE OF EXPRESSWAYS AS CHANNELS FOR EMERGENCY EQUIPMENT—Technical Bulletin No. 174, American Road Builders' Association, International Building, Washington 4, D. C. 25¢.

PREPARING TECHNICAL MATERIAL FOR PUBLICATIONS: A Manual for Authors of College and Station Publications—Circular Series No. 62, University of Illinois Engineering Experiment Station, Urbana, Ill. 60¢.

A PROGRESS REPORT, BUILDING RESEARCH IN CANADA—The Division of Building Research, National Research Council, Ottawa, Ont., Canada.

THE EXTREMUM PRINCIPLES OF THE MATHEMATICAL THEORY OF ELASTICITY AND THEIR USE IN STRESS ANALYSIS—Bulletin No. 119, University of Washington Engineering Experiment Station, Seattle, Wash. 75¢.

WATER SUPPLIES FOR WARTIME FIRE FIGHTING—Technical Manual, Federal Civil Defense Administration. Obtainable from the Superintendent of Documents, Washington 25, D. C. 10¢.

SEWAGE PURIFICATION BY ROCK FILTERS: The Performance of Standard-Rate Trickling Filters—Bulletin No. 123. Texas Engineering Experiment Station. College Station, Texas.

HYDRAULIC MODELS AS AN AID TO THE DEVELOPMENT OF DESIGN CRITERIA—Bulletin No. 37. Waterways Experiment Station. Vicksburg, Miss. 50¢.

SNOW STUDIES IN GERMANY—Technical Memorandum No. 20, National Research Council of Canada. Associate Committee on Soil and Snow Mechanics, Ottawa, Ontario.

SOME GENERAL CONSIDERATIONS IN THE NATURAL VENTILATION OF BUILDINGS —Research Report No. 22, Texas Engineering Experiment Station, College Station, Texas.

THE FEASIBILITY OF USING MODELS FOR PREDETERMINING NATURAL VENTILATION—Research Report, No. 26, Texas Engineering Experiment Station, College Station, Texas.

PHYSICAL PROPERTIES OF SOME SAMPLES OF ASBESTOS-CEMENT SIDING—Building Materials and Structures Report 122, National Bureau of Standards. Superintendent of Documents, Washington 25, D. C. 15¢.

PAVEMENT MARKING—Bulletin No. 36, Highway Research Board, 2101 Constitution Avenue, Washington 25, D. C.

In "ball-bearing" sand...

3 D TOURNAPULLS deliver 198 yds. hourly on 1850′ haul for Finley P. Smith Co.

On 136,000-yard railroad grade separation over U. S. 1 north of Fort Pierce, Florida, material to be moved was the worst kind of ocean sand . . . very loose, very hard to load, and unusually soft underfoot. After careful consideration of available dirtmoving machines, Finley P. Smith Construction Company of Ft. Lauderdale decided to handle 100% of the yardage with 3 electric-control D Roadster Tournapulls.

"These 'D's' are the *only* equipment I've seen on the market that will handle ball-bearing or Ft. Pierce sand economically," said owner Finley Smith when the Tournapulls had 8 weeks of work behind them. "My 3 Roadsters have been hauling an average of 190 cubic yards of this sand an hour ever since we started the job. We're ahead of schedule!"

Time study figures covering a typical section of the job showed the 3 Tournapulls made 33 trips and placed 198 pay yards hourly on a one-way haul of 1850 ft. Cycle time of 5.10 minutes included 25 to 30 seconds to push-load 6 pay yards of sand, and 12 to 15 seconds to spread. Haul speeds averaged 9.4 m.p.h. for each rig, despite travel over very soft, sandy haul roads which crossed both the Florida East Coast Rwy. tracks and the heavily-traveled highway.

HERE'S WHAT SMITH'S CREW SAYS:

C. M. Ray, operator . . . "I've operated all types of crawler-scraper rigs and rubber-tired units, and haven't seen anything that will beat the D Roadster."

J. N. Greene, master mechanic . . . "Only machines I've ever seen that will haul this Ft. Pierce sand. Daily maintenance is at a minimum on these rigs."

J. W. Walker, general superintendent . . . "Tournapulls are the best hauling units you can buy."

F. P. Smith, owner . . . "They're real producers, even in sand. We're ahead of schedule!"

Get all the facts today!

Ability to deliver more yards per hour on both cross-country and highway hauls . . . handle more jobs per year . . . earn more profit per job, are reasons why successful dirtmovers everywhere are turning to high-speed, electric-control D Tournapulls. Ask your LeTourneau Distributor to show you what 28 m.p.h. rubber-tired "D's" can do for you.

LETOURNEAU LET EQUIPMENT

R. G. LeTOURNEAU, INC., Peoria, Illinois

HIGH-SPEED, RUBBER-TIRED EXCAVATING • HAULING • LIFTING EQUIPMENT

LAND

SLIDE!

but this line did not fail

That landslide dumped hundreds of tons of rock on this steam line of National Seamless Steel Pipe, but service continued *uninterrupted* without a sign of break, or leak, or distress of any kind in the pipe.

That's the beauty of National Seamless. It can "roll with the punches" and come back for more.

Of course you don't buy pipe to wrestle with landslides. But you do buy pipe with the expectation that it will stand up under a lot of punishment in service—if the unexpected should happen. In other words, you want a good margin of safety beyond the line of ordinary duty. Well, that's exactly what made Seamless the wise choice in this particular landslide and in many other similar instances where unexpected stress and strain gave the pipe a real workout to prove its superior strength.

From points all around the country and from various types of service, come reports like this to confirm the wisdom of those who in the past have specified Seamless—Walls Without Welds—America's most widely-used pipe, where reliability is the first consideration.

NATIONAL TUBE DIVISION, UNITED STATES STEEL COMPANY
PITTSBURGH, PA.

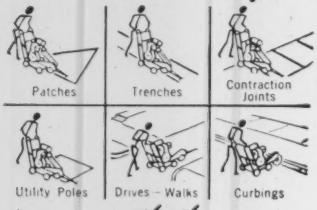
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS TRADE MARK

U·S·S NATIONAL SEAMLESS
PIPE AND TUBING

UNITED STATES STEEL

Save by Sawing...



with the

CLIPPER CONCRETE SAWS

You save Time and Material when you cut straight, smooth edges with a Clipper Concrete Saw before breaking out for patches, trenches or machinery bases. Eliminate radial cracks—stop spalling! Imagine... Saw up to 12' per minute 1" deep in Limestone aggregate concrete!

Saw ¼ slab depth... then break out. Only a minimum of replacement material necesssary!

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Send FREE Literature, Information and Prices on the NEW CLIPPER CONCRETE SAWS SC

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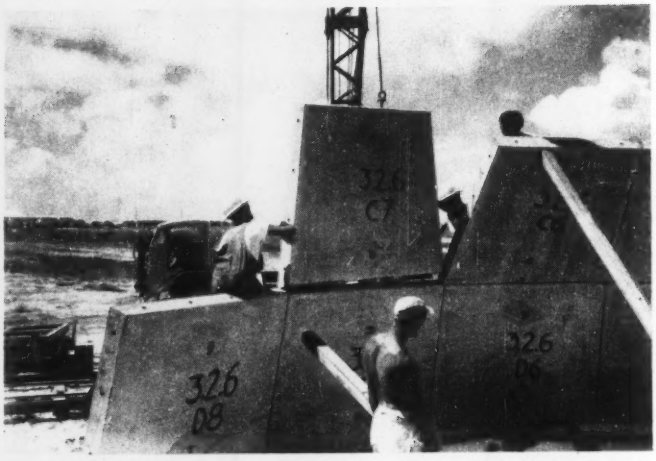


PRECAST CONCRETE PANELS bolted together (above) to form a domed shelter (below) were tested in the atom-bomb blasts at Eniwetok Atoll and appeared suitable for personnel protection.

Concrete huts withstand A-bomb tests

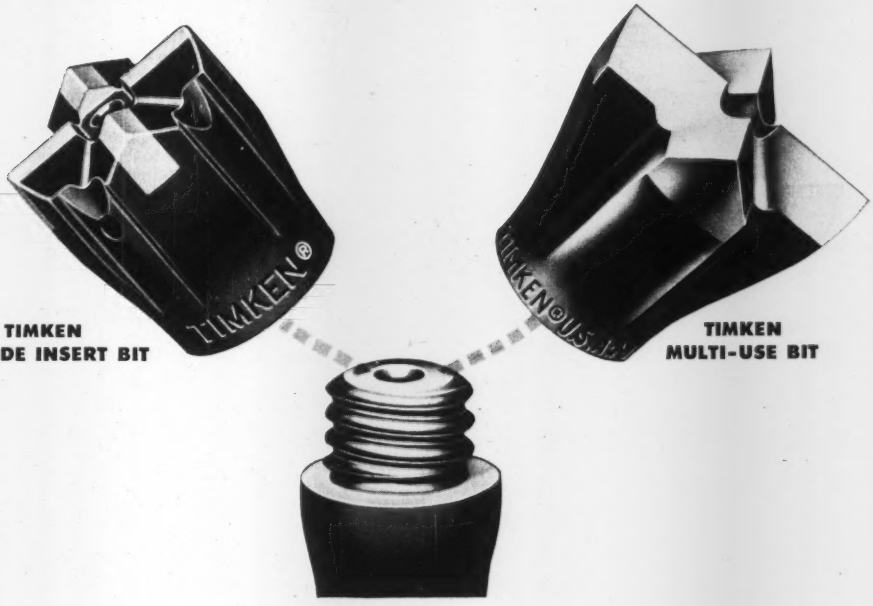
Information has just been made available on blast resistance of various types of structures in last year's atom-bomb explosions at Eniwetok Atoll. It throws some light on design requirements for bomb shelters. The complete interim report, however, is still considered classified.

Lt. P. J. McEleney reports in the February issue of the U. S. Navy Civil Engineers Corps Bulletin that the most successful structures tested were made of precast concrete. These were formed with thin-shell ribbed panels, either welded or bolted together in the shape of arches, domes or gables.

Structures were designed statically for a 40-psf snow load and a 70-mph wind load and then analyzed for their dynamic resistance to blast. When covered with 2 ft of earth, they may be used as personnel shelters, safe from blast and radiation at ½ mile from ground zero (assuming a Japanese-type atomic explosion). Mr.

(Continued on page 86)

BOTH FIT THE SAME DRILL STEEL!



TIMKEN CARBIDE INSERT BIT

TIMKEN MULTI-USE BIT

Interchangeability of TIMKEN® bits lets drillers switch quickly to the most economical bit for any drilling condition

NO need to have more than one type of steel at the drilling face.

With correct and controlled reconditioning, Timken® multi-use bits give you the lowest cost per foot of hole when full increments of steel can be drilled.

Timken carbide insert bits are the most economical bits for hard and abrasive ground, and your best bet for maximum speed, constant-gauge holes, small-diameter blast holes and very deep holes.

The combination of the two is unbeatable—puts the best answer to every drilling requirement right at your drillers' fingertips. Timken carbide insert bits and multi-use bits are interchangeable in each thread series.

Remember that both types of Timken rock bits have these three important advantages: (1) made from electric furnace Timken fine alloy steel, (2) threads are not subject to drilling impact because of the special shoulder union developed by the Timken Company, (3) quickly and easily removable.

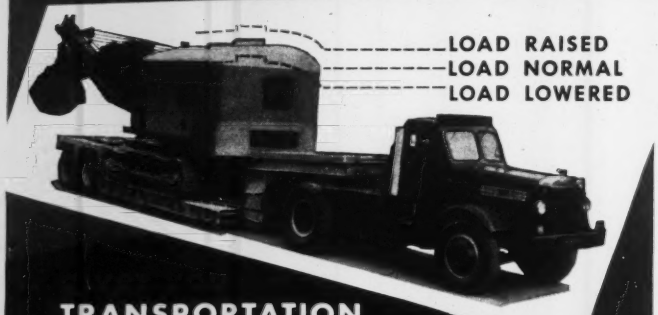
To get the drilling performance you're after call on the Timken Rock Bit Engineering Service. Backed by 20 years' experience in solving rock bit problems, our rock bit engineers can help you select the best bits for your job. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

your best bet for the best bit . . . for every job

TIMKEN

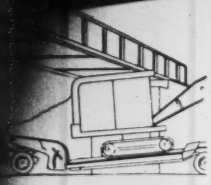
TRADE MARK REG. U.S. PAT. OFF.

Only ROGERS TYPE "TPG" Power Lift
DETACHABLE GOOSENECK

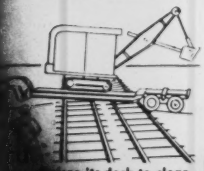


TRANSPORTATION

LOAD MANIPULATION



Stoops to clear low overhead obstructions.



...s its deck to clear ...hanked crossings.

The unique deck raising and lowering feature of this Rogers trailer makes load manipulation a distinct advantage under many hauling conditions.

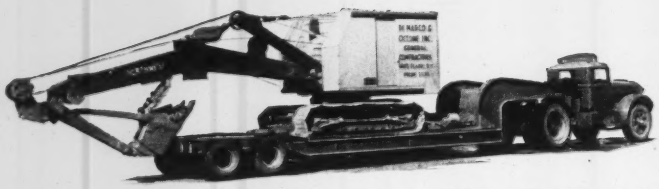
Low bridge or high road bed obstacles are easily overcome. Deck is raised or lowered to alter overall height of load for overhead clearance. Raising deck clears high road beds.

Write for literature and full particulars or call your nearest agent.

THE ROGERS Power Lift DETACHABLE GOOSENECK CAN BE OBTAINED ON ANY STANDARD ROGERS DROP DECK TRAILER

EXPERIENCE builds 'em — ROGERS — PERFORMANCE sells 'em

ALBION, PENNA.



A Rogers Type "D" Trailer

Research . . .

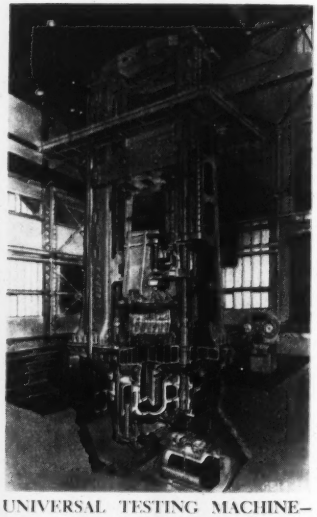
McEleney claims. The earth increases the effective resistance of the structure to blast, he says, by addition of mass, streamlining and attenuation of some of the blast energy, while at the same time absorbing thermal or nuclear radiation.

For one test structure with brick curtain walls, precast panels were attached to the structural frame and also bolted to the masonry, to see if they would prevent collapse. Tests indicated that they provided "considerable protection." New tests are being prepared for next month.

Lehigh University to have powerful testing machine

What is said to be the world's largest vertical universal testing machine is to be installed in a new building to adjoin the Fritz Engineering Laboratory on the Lehigh University campus at Bethlehem, Pa., it has just been announced by President Martin D. Whitaker of the university. The total cost of the new equipment and building, to be ready by September, 1954, is estimated at about $1.2 million. The installation is to be made in cooperation with the Bethlehem Steel Co.

The new building will house a (*Continued on page 90*)



UNIVERSAL TESTING MACHINE—Shown is a model of the vertical universal testing machine to be installed in a new building on the campus of Lehigh University, Bethlehem, Pa. Total cost of the new building and equipment is estimated at $1,200,000. This is a 5-million-lb capacity hydraulic tension-compression machine.

NOT FOR THE SHELF...

This Construction Machinery Lubrication Book

WORKS ON YOUR DESK

Look up Crawlers, or Calcium Greases, or Diesels or whatnot concerning Earth Moving and Construction Equipment. You'll find your subject covered authoritatively and understandably, from mechanical principles to technicalities. You'll realize that your up-to-the-minute Cities Service book of 56 pages, with sharp drawings and photos, has been developed to broaden your own fundamentals of lubrication *whys, hows and whats.*

You will be able to size up closely the Cities Service lubricants described. You'll notice the self-evident good sense of each specific Cities Service recommendation. And man, it really is specific, because Cities Service makes such a complete line for all types of equipment you may employ. This book's recommendations on Cities Service lubricants—as field records show—will produce savings of oil, grease, downtime and parts to make your judgment look mighty good. Now ... write for your 1952 edition of *Earth Moving and Construction Machinery Lubrication.* CITIES SERVICE OIL COMPANY, Dept. C14, Sixty Wall Tower, New York City 5.

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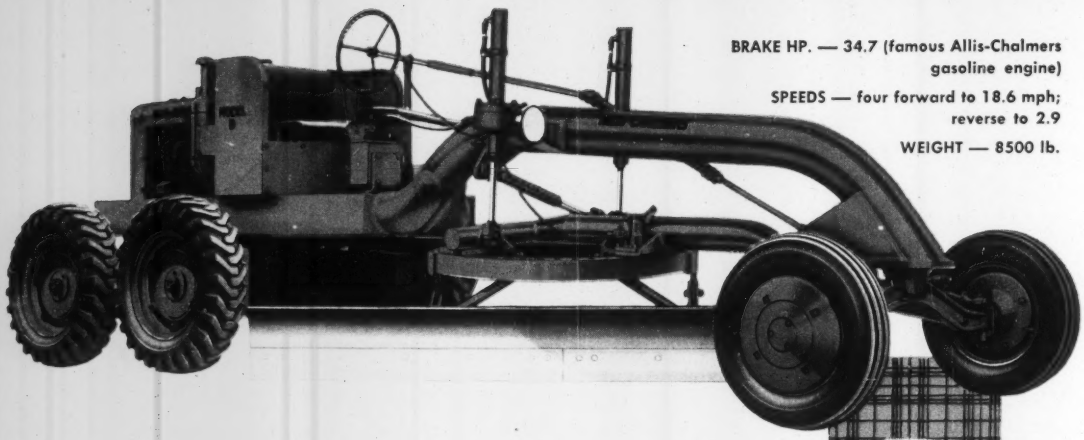

BRAKE HP. — 34.7 (famous Allis-Chalmers gasoline engine)
SPEEDS — four forward to 18.6 mph; reverse to 2.9
WEIGHT — 8500 lb.

only the *Allis-Chalmers* **model D**

Does so many jobs at

Low first cost • Tandem drive • plus matched attachments

Here's a grader with power and capacity to do an outstanding job the year 'round on both construction and maintenance . . . yet it costs only one-third as much as large graders. The most important reason for this unequalled performance is sure-footed TANDEM DRIVE. This big grader feature provides better traction, easier riding, smoother blading under *all* conditions . . . and it's *exclusive* with the Model D in this class.

What's more, with easily mounted, hydraulically controlled rear-end loader, scarifier, snowplow and windrow eliminator, there's almost no limit to the jobs it can handle with real savings. See your Allis-Chalmers dealer now and let him give you a working demonstration.

the newest, finest line on Earth!

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Builds Roads and Streets

Scarifies Toughest Surfaces

Slopes Banks

Cuts and Cleans Ditches

Strips Sod, Handles Terracing

Finishes Between Forms,
Levels Sub-divisions

so little cost

make it the biggest value of them ALL!

Grades Shoulders

Maintains Without Leaving Windrows

Works and Spreads Oil Mix

Loads Surplus Dirt
or From Stockpiles

designed for your jobs!
built to take it!
easy to operate!
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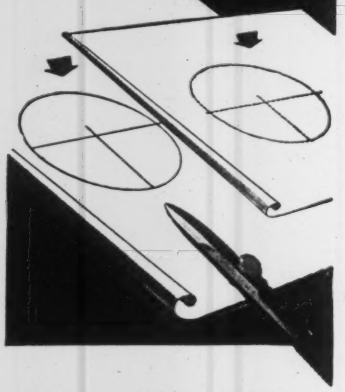
Plows Snow

Loads Snow

Imperial
TRACING CLOTH
THAT DEFIES TIME!



• The renown of Imperial as the finest in Tracing Cloth goes back well over half a century. Draftsmen all over the world prefer it for the uniformity of its high transparency and ink-taking surface and the superb quality of its cloth foundation.

Imperial takes erasures readily, without damage. It gives sharp contrasting prints of even the finest lines. Drawings made on Imperial over fifty years ago are still as good as ever, neither brittle nor opaque.

If you like a duller surface, for clear, hard pencil lines, try Imperial Pencil Tracing Cloth. It is good for ink as well.

Imperial
TRACING CLOTH
SOLD BY LEADING STATIONERY AND DRAWING MATERIAL DEALERS EVERYWHERE

Research . . .

(Continued from page 86)

5-million-lb capacity hydraulic tension-compression machine to be constructed at an estimated cost of $400,000, accessory equipment valued at $300,000, and modern laboratories.

The machine with a height of about 53 ft above the floor will permit the testing of building columns and the compression members of railroad and building trusses. Tests can be made on members 36 ft long and of a cross section used in such structures. Structural tension members 36 ft in length, such as suspension bridge cables and those for large railroad bridges can also be tested.

A new 20-ton overhead crane will permit easy handling of structural components.

Primary responsibility for the design and supervision of the construction and installation of the giant testing machine will be shared by representatives of the Bethlehem Steel Co., and the Baldwin-Lima-Hamilton Corp., and Prof. Wm. J. Eney, head of the department of civil engineering and mechanics, who is also director of the Fritz Engineering Laboratory.

Sea-water desalting idea presented, not explained

Continuous electrical–deionization using ion exchange membranes was demonstrated late last month in Boston, Mass., and presented as a means of desalting sea water. No exact details of how the process works were given out.

Quest for further explanation of the process, following receipt of the general release, brought ENR information that the research is being done for the Navy; classification is uncertain; the single installation at present under test is not of municipal-water-supply scale.

This much is known: The process is truly continuous. It requires no chemicals, no regeneration of any kind. It consumes only electrical energy. A single stream enters the device; two streams emerge—one fresh, the other containing all the pollutants. Fresh water effluent is about two-thirds the influent. The apparatus has no moving parts.

This is claimed: Prof. E. R. Gilliland, of MIT's department of chemical engineering, in announcing the process called it capable of producing fresh water at low flow rates at an electrical consumption of 20 kw per 1,000 gal–6 cents per 1,000 gal in areas of low power cost. He compares this with irrigation water sold for 2 to 20 cents per 1,000 gal. Overall cost of the process should fall in the range of 10 to 20 cents per 1,000 gal, he claims.

And this is conjecture: Neither Walter Juda, the developer, nor Professor Gilliland, president of Ionics, Inc., the development firm, will say just what the electrical energy consumed does. But they speak of "selectively permeable" membranes, and it is indicated that current in the resin membrane forms the barrier to ions.

Sulphite liquor method may cut road sanding cost

How to take the worst skids out of winter driving has long been a major problem in most states of the nation. Present methods are costly and short lived. But in Wisconsin they are making an experiment using sulphite liquor to bind sand to the slippery road surface.

Under usual road sanding methods sand mixture and spreading operations usually run about $6 per cu yd. Then the grit lies loose on the road with much of it thrown to the shoulder by passing cars. What little remains is often lost when the next snow is plowed off. The cost of spreading sand for only a few days of usefulness has prevented its application to many slippery stretches.

So this winter Price County Highway Commissioner Matt Freeman has been conducting experiments at Park Forest by whetting glare ice with hot sulphite and following quickly with a sand spread. The sand freezes to the surface and provides a more lasting grit. The hot sulphite seems to pit the glare ice surface when it strikes. The secret of successful sanding is to have the sand truck, with a rotary sandslinger, following so close behind that the sand hits before the liquid freezes again. Sulphite liquor is being used because it comes hot from the poker mill at no cost.

In Price County the Flambeau Paper Division of the Kansas City Star Co. has provided the road binder used in the experiment. Engineers of the Sulphite Pulp Manufacturers Research League have also been cooperating with paper mill and road officials in reducing sulphite pollution of Wisconsin streams.

Research brief . . .

• **Fluorescent rating**—The school board of Milwaukee, Wis., has adopted a rating guide for the purchase of fluorescent fixtures. Besides the cost, other factors to be considered are economy of operation, construction, cleaning, quality and output of light, and how directed. The plan was developed by L. V. James, engineering consultant, and S. J. Sutherland, chief of the board's construction division.

A BIG NAME

In Sanitation Circles . . .

"HYDROLESE"

All collectors in service at the Hyperion Sewage Treatment Works, City of Los Angeles, are "HYDROLESE" protected.

Grit Washers
Grit Collectors
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Positive protection against overloads—elimination of troublesome shear pins . . certain when Jeffrey "HYDROLESE" Hubs are used on the countershafts with sprockets keyed to them.

The "HYDROLESE" Hub

- **Can be adjusted to meet various load conditions.**
- **Can be provided with visual warning of overload.**
- **Can be readily reset.**
- **Will not burn up.**
- **Will carry a definite torque load (Max. 20,000 lbs.).**

This device has won wide favor in Sanitation circles—132 units used on the Los Angeles job. Send for complete information.

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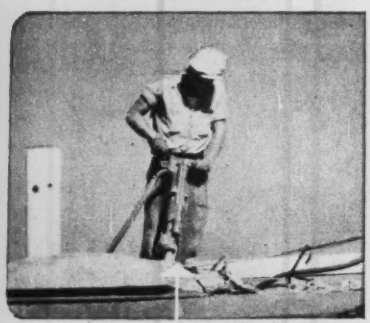
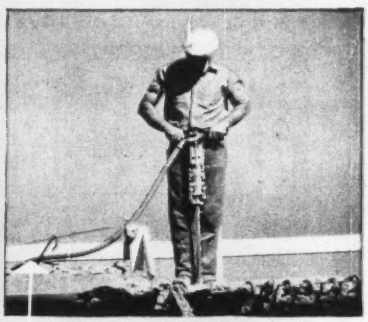
LE ROI GIVES YOU MORE FOR YOUR MONEY!



Le Roi-CLEVELAND Breakers and Spades pack plenty of punch for speedy work in the hardest concrete or stiffest clay. Protective air-cushion in front end assures long life. Well balanced for easy handling. That's why operators like them — do more work with them. Sizes, 18 to 80 lbs.



Le Roi-CLEVELAND Sinkers have strong rotation, powerful blow from snappy valve action. Drill more inches per minute. Easy to hold, kickback is reduced. Operators get less tired, drill more feet per shift. Sizes, 17 to 82 lbs., including the popular H10 and H111.

Pair gets more done—costs less to own

A team you can't beat!

Le Roi AIRMASTER Compressor and Le Roi-CLEVELAND Air Tools

YOU'RE money ahead, when you hook up Le Roi-CLEVELAND Air Tools to a Le Roi Airmaster Compressor. They *work together*, to put more profits in your pockets!

You can't beat an Airmaster, when it comes to producing air at low cost. Super-finished, cushioned valves help your Airmaster deliver air efficiently and dependably — and maintain higher average working pressures. Slow operating speeds and conservative rating provide protection against on-the-job failure, reduce wear-and-tear.

Le Roi-CLEVELAND Air Tools include paving breakers, hand-held drills, wagon drills, drifters, spades, and backfill tampers. Their exclusive valve action keeps air consumption low. They're built to take it, too.

That's why you see Le Roi Airmaster—Le Roi-CLEVELAND teams at work on so many jobs in so many different places!

Have your nearest Le Roi distributor show you a team in action. Call on him now. Write for bulletins.

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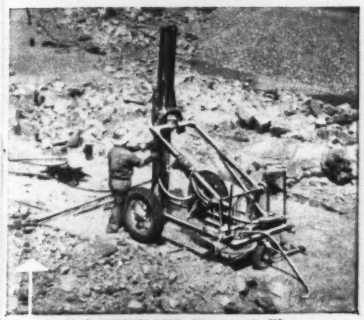
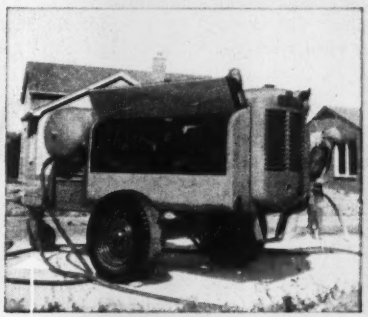
MORE AIR POWER! MORE FOOTAGE! MORE PROFITS!



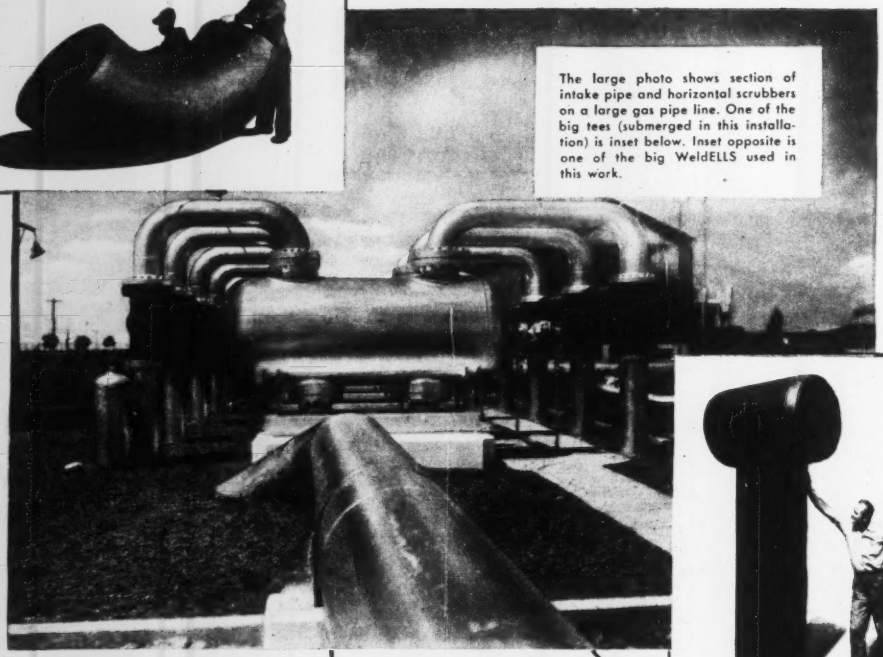
Le Roi-CLEVELAND Wagon Drills put your deep holes where you want them for better breakage, lower costs. Drill at any angle, 4" bore, powerful force of blow, strong rotation, thorough hole-cleaning action. Higher drilling speed with big bits. For shallow holes, the lightweight DR34 unit is your best bet.



Le Roi Airmasters have 10% to 30% lower piston speed—for less wear, longer life, lower fuel consumption. Heavy-duty Airmaster engine is designed especially for compressor service — it is not just an automotive unit slowed down. Airmasters stay on the job longer, produce more air for less. Sizes, 60 to 600 cfm.

Tractair is a combination tractor-105 cfm compressor that can be equipped with a wide variety of attachments. Does the work of specialized equipment — breaking, drilling, digging, tamping, loading, lifting, backfilling, snow-plowing, etc. Saves you money on initial investment and on job costs.

The large photo shows section of intake pipe and horizontal scrubbers on a large gas pipe line. One of the big tees (submerged in this installation) is inset below. Inset opposite is one of the big WeldELLS used in this work.



GUESS-WORK WON'T GO ON THE PIPE LINES

As the demand for oil and gas mounted, the pipe lines grew. The first growth was in number and miles; then in size and pressure. The use of larger pipe lines under higher pressure has hurled a challenge at the pipe designer. To hold down costs he must press further toward the yield point of pipe line materials . . . but never too near the danger point. Sound engineering is indeed required to insure safe operation under loadings that stress materials at 65% to 85% of their yield strength. There is no "margin for ignorance" here. You must *know!*

Recent Taylor Forge contributions to the pipe lines include improved designs of WeldELLS in large sizes and tees giving greater safety at branch connections . . . produced in materials whose strength matches or exceeds that of the tough API5LX pipe now being used in transmission lines.

Ask for the facts about the WeldELL line of welding fittings and Taylor Forged Steel Flanges.

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Public agencies compete for money

The growing demand for money by public agencies—hopeful now that they can get materials to get needed construction projects under way—is posing a pretty problem of distribution for the money markets:

Although higher taxes on private and corporate incomes are making it more attractive for investment capital to go into public bonds, more and more offerings of such bonds are being made. The places where capital can go are increasing daily—and thus the competition for the money.

All of which explains the fact that the costs of "renting" money by municipalities and other governmental units are rising (ENR Feb. 14, p. 62).

Added to the increasing offerings by public agencies, too, are ever-increasing calls for new money by private corporations. Witness offerings of corporate securities totaling $50 million registered last week with the Securities and Exchange Commission, and the increasing flow of investment capital to "mortgage" financing of industrial construction (ENR March 6, p. 103).

• **Not worried, yet**—Nobody seems to be too much worried about the situation yet, although signs of a tightening money market have been pointed out by bankers and others.

But, in spite of the attractive features of tax-free bond issues, bond houses in New York point out that there is now a normal "floating" total around $150 million in high-grade municipals available to buyers daily.

• **Selectivity in order**—That "floating" pool of bond offerings is an indicator of something important—the fact that investors are getting more selective in what they buy, demanding far more careful study of credit ratings, potential return and that the work to be financed be useful and needed (not golf courses). By the same token, it points to a tougher time for a lot of the uses to which municipal credit is being put—in particular to back industrial development.

On this particular point (which the bankers don't like, anyway) where municipalities put their credit behind construction of plants for industry—there is one major fear: The federal government may decide that such use of tax-free privileges is not proper. If that happens, rates on these bonds may get out of sight.

• **Time is now**—In spite of these facts, however, bond counsellors think that municipalities with legitimate projects on their books should go right ahead with their plans for bond issues.

They point out that the market is sufficiently uncertain to make guessing ahead of it pointless. New taxes, the actions of Congress in an election year, the defense program and many other factors will have their effect.

"The money cost is higher now than it has been since World War II," said one consultant, with an average somewhere around 2.10% yield. But back in the '30's they were higher yet—up around 5%.

"But of course the principal required in the '30's was much smaller. So the net difference then and now is actually small. In other words—if your city has a worthwhile and needed project for which it needs money—go ahead with it."

Corporate securities post highest total since 1929

Last year U. S. corporations offered more new securities for sale than in any year since 1929, according to the Securities and Exchange Commission.

In a report made public last week, SEC said that new securities offerings in 1951 amounted to $7.8 billion, compared with $6.4 billion in 1950, and $7.1 billion in 1948, which was the previous high for recent years.

Corporations raised $5.4 billion last year for plant expansion and $1.4 billion for additional working capital. The funds obtained in the securities market for plant and equipment were higher than in any year on record.

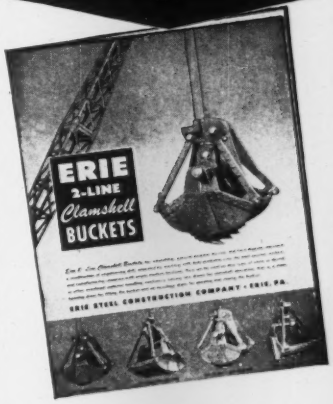
• **Bond market uncertain**—Privately-placed securities reached a new record of $3.4 billion in 1951. This compares with $2.7 billion in 1950, and $3.1 billion in 1948, which was the previous peak for private transactions.

The increase during 1951 in the volume of direct offerings was due to a number of factors, SEC said, including uncertainties in the bond market and greater use of the forward commitment.

Including both public and private offerings, the distribution of the $7.8 billion corporate offerings among the various industry groups was: Manufacturing firms, 40%; electric and gas companies, 32%; communication com-

(Continued on next page)

HOW TO GET
Larger
BUCKET
PAYLOADS



This new Erie Catalog makes it possible to quickly choose, from the 4 classes of Erie 2-Line Buckets, the right bucket for *your* crane and material. Perhaps your crane can operate a larger bucket, for Erie alloy welded steel buckets result in greater payloads through scientific bucket weight reduction. Remember, that on bucket work, the cost of the crane and the operator all ride on the bucket. Send for this helpful catalog or outline your conditions and our engineers will make recommendations.

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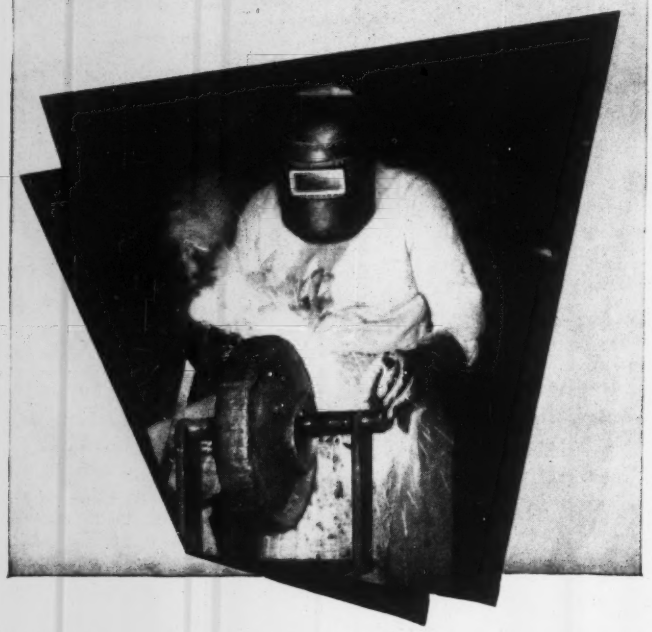

Because of the hardness and other desirable characteristics of these alloys, they provide high resistance to all types of wear – abrasion . . . impact . . . heat . . . corrosion. One application often adds 2 to 25 times longer service life to *worn or new* parts . . . big dividends in savings of "down-time" and replacements.

There is an Airco alloy available for oxyacetylene flame or electric arc application to meet all types of wear conditions.

1. *Severe abrasion and medium impact*
2. *Shattering impact and abrasion*
3. *Severe impact and abrasion*
4. *Sliding abrasion and impact*
5. *Extreme earth abrasion*
6. *Corrosion and heat*

Constant research is developing new alloys to meet special wear problems as they occur.

If you have parts or tools subject to any type of wear, it will pay you to investigate the savings you can make in maintenance and replacement costs by using Airco Hardfacing Alloys.

For further information about Airco's complete line of "wear-resistant" alloys, write your nearest Airco office or Authorized Dealer for a free copy of the Hardfacing Alloys Catalog.

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Finance . . .

panies, 8%; commercial and miscellaneous firms, 7%; real estate and financial companies, 7%, and railroad and other transportation companies, 6%.

• **Less refunding**–Refinancing activity declined sharply in 1951, reflecting higher interest rates, SEC reported. Less than $900 million of securities were offered to refund outstanding debt, bank loans and to retire preferred stock. This was a billion dollars less than in 1951.

State plan investment in institutional buildings

Plans for heavy investment in state institutional buildings are apparent as state legislatures begin consideration of budget requests from their chief executives.

In 10 states alone (California, New Jersey, New York, Pennsylvania, Kentucky, South Carolina, Texas, Virginia, and Minnesota) governors have asked for funds totaling more than $267 million to finance such construction work. Other states are sure to follow.

Means of financing this work vary almost from state to state. California expects to handle its $57 program through appropriations; New Jersey would issue $25 million in state-backed bonds; Pennsylvania already has authorized its General Assembly to increase its borrowing capacity by $60 million; in Texas, the State Hospital Board was permitted (under a ruling of the Attorney General's office) to anticipate income for two-year periods (instead of one) as a base for letting contracts.

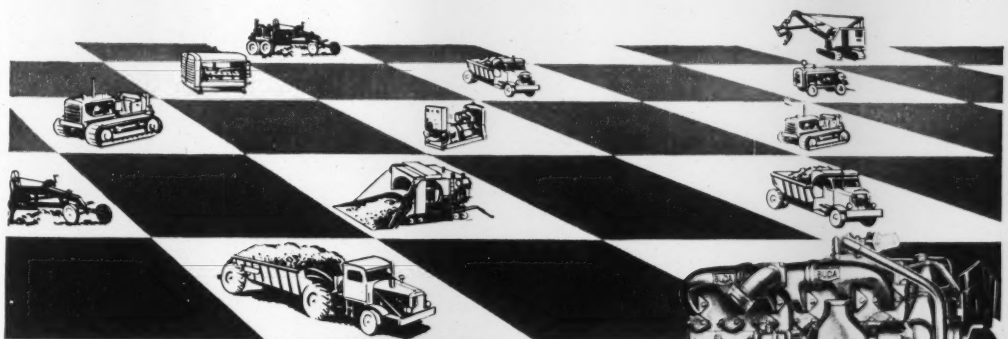
Finance briefs . . . . .

• **Home finance changes**–Major changes in the home financing picture, including the fact that relatively larger and higher priced houses were built and the buyer with an income of less than $400 a month nearly disappeared, are catalogued in the forthcoming issue of Housing Research, due for distribution this week. The quarterly is a publication of the Housing and Home Finance Agency.

• **Oregon sells highway bonds**–A syndicate composed of Bankers Trust Co. and National City Bank of New York (and associates) was successful bidder on purchase of $15 million Oregon State Highway Commission bonds. The bid was $98.81 for each $100 of par value, with an effective rate of interest at 1.6348%.

• **Sewerage bonds**–Voters of Ontario, Calif., will decide on a $2 million bond issue proposal in April, to finance an outfall sewer and for additional sewer lines within the community.

the smart move is to Buda Diesels



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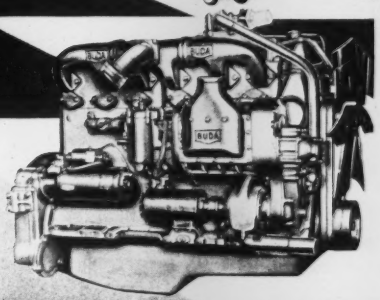

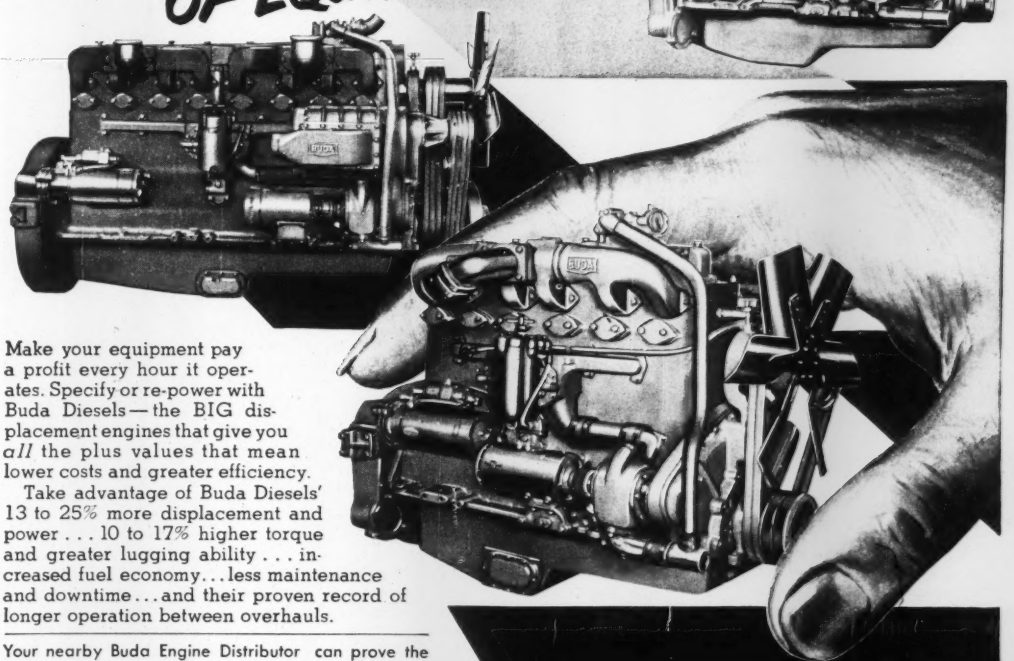

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Take advantage of Buda Diesels' 13 to 25% more displacement and power . . . 10 to 17% higher torque and greater lugging ability . . . increased fuel economy . . . less maintenance and downtime . . . and their proven record of longer operation between overhauls.

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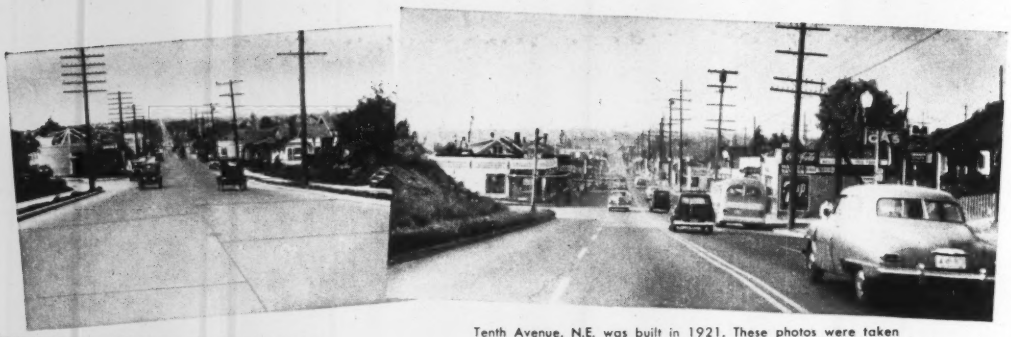
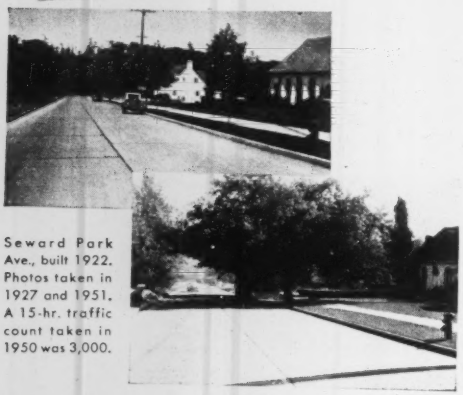


Tenth Avenue, N.E. was built in 1921. These photos were taken in 1924 and 1951. A 15-hour traffic count in 1950 was 18,500.



Seward Park Ave., built 1922. Photos taken in 1927 and 1951. A 15-hr. traffic count taken in 1950 was 3,000.

W. 70th St., built in 1922. Photos were taken 1924 and 1951. 15-hr. traffic count in 1950 was 2,500.

Here today – *and still here tomorrow* . . . that's the story of Seattle's *CONCRETE* Streets

Seattle has more square yards of concrete streets per capita than any other city in America with more than 100,000 population. There's a reason: city records, covering a 25-year period (less than the age of some of the streets shown here) reveal that concrete streets cost less than one-tenth of a cent per sq. yd. per year to maintain. Two other types cost $5\frac{1}{2}$ and 7 times more.

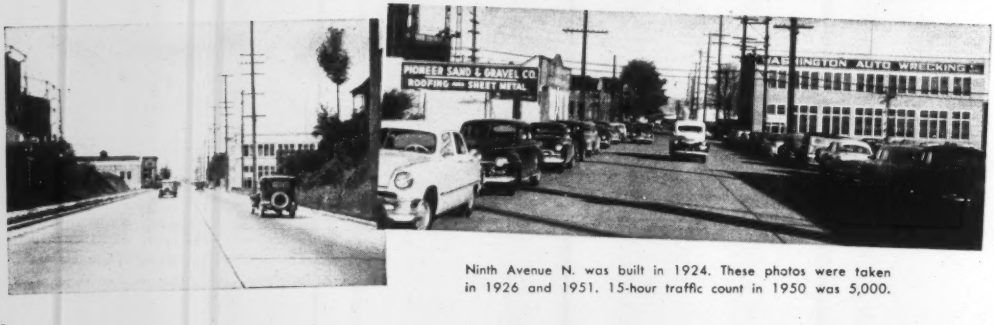
Like Seattle, hundreds of cities have found that concrete streets give dependable, ***low-annual-cost*** service, often for 25, 30, 35 years and longer. Concrete streets are "*here today—and still here tomorrow.*"

Today concrete pavements are even more durable because of improvements in engineering design, in materials and in construction methods. Concrete is moderate in first cost, costs less to maintain and lasts longer. Result: ***low annual cost***. Concrete is safer too. Wet or dry, its uniformly high skid resistance permits quick, sure stops. Its light color enables you to see better at night—and saves on street lighting costs as well.

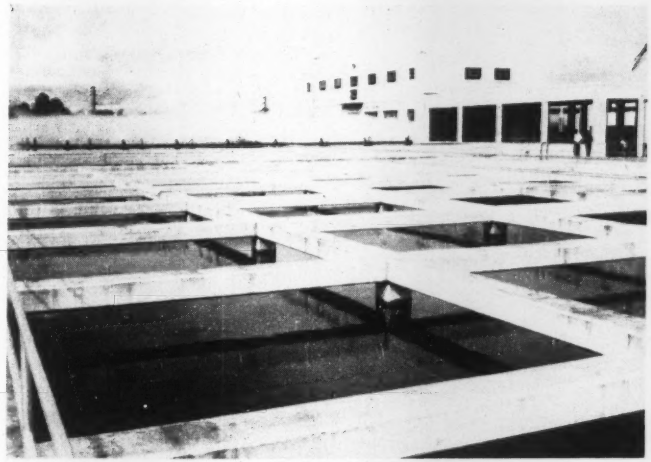
PORTLAND CEMENT ASSOCIATION

33 West Grand Avenue, Chicago 10, Illinois

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work



Ninth Avenue N. was built in 1924. These photos were taken in 1926 and 1951. 15-hour traffic count in 1950 was 5,000.



FILTRATION PLANT FOR SAN JUAN—Through this new filtration plant will pass 30 mgd to provide the people of San Juan, Puerto Rico, with pure drinking water. It is part of the new water system made possible by completion of the $2,700,000 Loiza River Dam. The dam, draining an area of 207 sq mi, also will act as a source of power for an emergency electrical plant which has three turbines developing 3,750 kva.

Puerto Rico makes substantial progress on $26-million Southwestern project

Irrigation of the arid Lajas Valley in Puerto Rico is being pushed so as to be completed by 1955, two years earlier than originally announced.

The project—now 40 percent finished—will bring water collected in four reservoirs near the headwaters of four rivers on the rainy north slope of the mountain range which divides Puerto Rico east and west, and carry it by tunnel 31,000 ft through the main divide to the south slope. Here it will join water from three other reservoirs and river systems, drop 1,200 ft to operate two power plants and feed into Rio Loco Reservoir (ENR Nov. 4, 1948, page 6).

From the Rio Loco Reservoir it will pass to the main irrigation canal, 25 miles long, of the rich Lajas Valley, and from this main canal be distributed through a system of subsidiary canals and laterals.

Besides water for irrigation and electric power plants, the system will provide flood control, and water supply for cities.

• **Spaniards tried it**—For more than 100 years, Spain sought ways to irrigate the Lajas Valley on a big scale. It failed. On April 16, 1916, the legislature of the island passed Act No. 72, authorizing the investigation of the Lajas Valley Project by the Insular Department of the Interior. This, too, failed, and it is thought it was too expensive. The present project was undertaken after $285,000 had been assigned to the study of irrigation possibilities. The assemblage and printing of the final report on the Lajas Project cost $250,000. But Puerto Rico, 100 miles long, 35 to 40 miles wide, and with over 2 million population, as large as that of Florida, but only one-seventeenth the size, had to go through with it.

The farmer will pay $13 for four ac ft of water delivered from the canals.

Mt. Blanc tunnel work to start soon, French say

On March 2 French authorities announced that work on the 7-mile tunnel under Mont Blanc in the French Alps between Chamonix and Cour-

(Continued next page)

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This M & H mechanical joint Cutting-In Sleeve makes it easy to install a mechanical joint or a hub end gate valve or pipe fitting into an existing pipe line. Out of the pipe line cut only a length of pipe equal to the over-all length of the valve or fitting to be installed, plus 9 inches. The mechanical joint Cutting-In Sleeve is then telescoped over one of the cut ends, the valve inserted into position and the Sleeve pushed back to socket into the valve bell. The joint is then bolted up if it is mechanical joint valve, or poured and calked if hub end valve. For complete information, write or wire M & H Valve and Fittings Company, Anniston, Alabama.

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International . . .

maveur (ENR Jan. 16, '47, vol. Page 78, and Aug. 23, '51, page 65) will begin in about two months, agreement having been reached by France, Switzerland and Italy.

To cost about $19 million, it will be the world's longest vehicular tunnel and one of the most important commercial and military links on the Continent, eliminating one of the worst traffic bottlenecks in Europe. It will provide a fast, direct highway between Paris and Rome by way of Geneva, where an international corporation will be set up to supervise.

It will take 3 years to build the tunnel. It will not be the first time the Alps have been tunneled. The Simplon railroad tunnel, consisting of two paralled bores, 21,576 yds. long, about 60 ft. apart, was completed 46 years ago, connecting Brieg in Switzerland and Iselle in Italy.

AERIAL FERRY—To get heavy truck traffic across the Tigris River between fabled Baghdad and Mosul, Iraq has built a 1,650-ft tramway, carried on 102-ft steel towers. Tramway consists of four main cables, 6½ in. in diameter, anchored to an 800,000-lb concrete block on the east bank, and counterweights on the west bank, pulling a car capable of carrying trucks up to 42 ft long, weighing up to 53,000 lb. British Ropeway Engineering Co., Ltd., London, built the tramway for Iraq Petroleum Co., Ltd.

International briefs . . .

• **Single nozzle turbines**—In the powerhouse at a new Swiss dam, Salonfe-Mieville, three Pelton turbines of 47,500 hp at 500 rpm are being installed, each operated by a single nozzle. This is believed to represent the highest power output per nozzle ever achieved. The turbines are being built by Ateliers des Charmilles S.A., Geneva, Switzerland.

(*Continued next page*)

International . . .

• **Lebanon water resources**—Robert F. Herdman of Hardin, Mont., an engineer of 20 years' experience with the Bureau of Reclamation, is to leave soon to head a party of bureau engineers and specialists to make a second study of possible water resource developments in Lebanon. The 21-man mission with headquarters at Beirut will make final preconstruction studies for irrigation and hydroelectric power. Also studied will be drainage, domestic water supplies, and economic factors. Most of the country's rainfall comes during winter and spring, much of it rushing to the sea unused. The mission will plan a program whereby this wasted water can be conserved in storage dams and put to beneficial use.

• **To restore Jamaica housing**—The government of Jamaica will launch a house building program to restore the 18,000 dwellings destroyed by hurricane last August, and a further 35,000 damaged. The program provides for the erection of 10,000 one-room wooden houses, and loans in cash or kind to 4,000 families to repair their damaged homes. The total outlay is about $6,700,000.

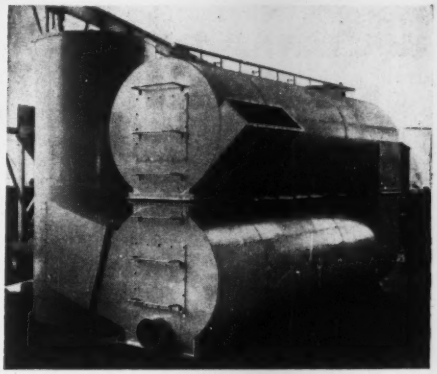
• **For Philippine power**—A credit of up to $20 million has been authorized by the Export-Import Bank to the National Power Corporation of the Philippines to assist in financing development of the hydroelectric potential of the Agno River, which is estimated at 430,000 kw. The corporation has started building a dam and reservoir at Ambuklao, near the headwaters of the Agno, and proposes to install generating equipment of 75,000 kw there. Besides serving the power needs in the Manila area, the plant will provide electric energy for the mines at Baguio. The Ambuklao project also will provide flood control and water for heavily-populated central Luzon.

• **Port work at Callao**—Peru's principal port of Callao, through which more than a third of the country's import-export business moves, will be scene of a $4-million improvement program concentrated largely on materials-handling facilities. Of the total to be spent, $2.5 million will come from a World Bank loan.

• **Seek water for Chile**—The Chilean Department of Public Works—spurred by the need for more irrigation water for farms—is carrying out exploration work for underground sources in the Rio Elqui Valley, 250 miles north of Santiago.

THE **MADSEN** DUAL WET TUBE DUST WASHER

HELPS SOLVE THE PROBLEM OF DUST AND GAS LOSSES IN ASPHALT PLANT OPERATION



Madsen leadership in engineering design solves a challenging problem in air pollution control. This Madsen Dust Washer centrifugally impacts the dust-laden gases against the wetted interior surface of the scrubber with a resultant absorption of the dust particles into the water stream. The horizontal design provides a maximum water use which results in an amazingly clean stack. Dust emission as low as 17 lbs. per hour with a through-put of 200,000 lbs. from the mixing plant has been obtained.

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Builders of fine machines and the buyers who use them endorse Wisconsin Engine Power . . . so much so that Wisconsin Engines are *first* choice in almost every field, 3 to 30 hp. For example, tapered roller bearings at both ends of every Wisconsin Engine crankshaft absorb all thrusts, reduce, too, the chance of bearing failure. And you'll also endorse fool-proof air-cooling in all weather, summer and winter, along with the easily-serviced OUTSIDE magneto with impulse coupling, delivering fast starts always.

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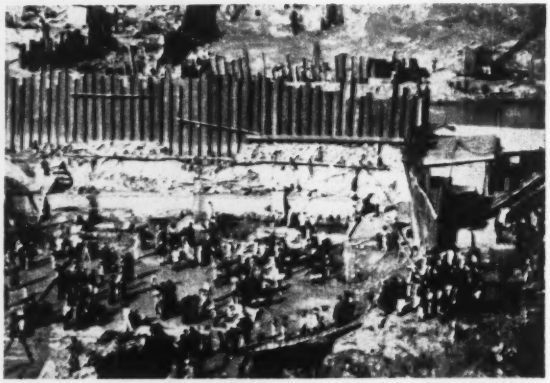
McKIERNAN-TERRY PILE HAMMER

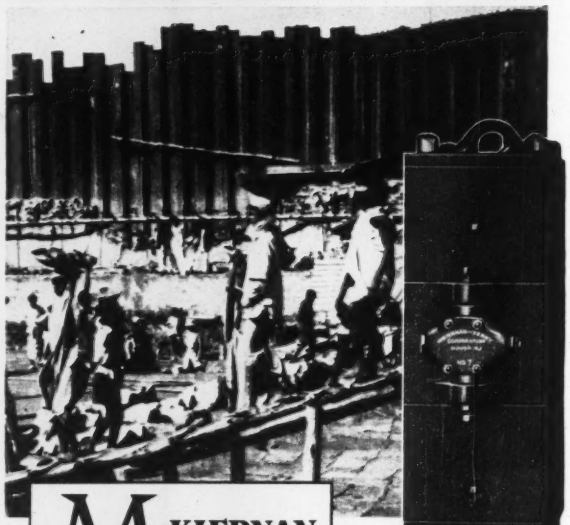
helps build a dam in India

The land of the Taj Mahal is going modern in a big way. In fact, the Damodar River project, which includes two dams and a steam power station, will supply power for the most highly industrialized region of India. Harza Engineering Company served as consultants on this project.

Naturally, a McKiernan-Terry Pile Hammer was called on to do a vital pile-driving job on this $142,000,000 project. Hundreds of steel piles for the cofferdam, shown in the photographs, were punched down with a McKiernan-Terry No. 7 Double-Acting Hammer.

Yes, in the far corners of the world . . . as well as on hundreds of pile driving jobs in the United States . . . McKiernan-Terry Pile Hammers and Extractors are the first choice of contractors. The wide range McKiernan-Terry line includes 16 sizes of hammers and 2 sizes of extractors. Bulletin gives full details. Write for your copy.





McKiernan-Terry
No. 7 Double-Acting Pile Hammer

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McKIERNAN TERRY

MK 318

Cover page

Post of honor given researcher Goldbeck

One more honor was added to the many he has received in his long, achievement-studded career when Albert T. Goldbeck was elected president of the American Concrete Institute this month.

Since 1925 Mr. Goldbeck has been engineering director of the National Crushed Stone Association.

His major field of work has been in highways and highway design. He has conducted and directed research in such fields as; stress distribution under static and moving loads, subgrade pressure measurements, studies of subgrade friction, impact studies, the flow of concrete, measurements of expansion and contraction, and other studies pertaining to pavement design.

He was the first chairman of the Committee on the Structural Design of Highways of the Highway Research Board, and served in that capacity for 14 years.

The Highway Research Board has given him its Distinguished Award for "outstanding achievement in the field of highway research." He has also been elected an honorary member of the American Society for Testing Materials.

Mr. Goldbeck is a graduate of the University of Pennsylvania, where he received a B.S. in Civil Engineering in 1906 and a C.E. degree in 1923.

Schmidt in roads post named by governor

Edward L. Schmidt, of Pittsburgh, Pa., has been named Pennsylvania secretary of highways by Governor John S. Fine. In this position he will direct the spending of an average of $100 million per year on maintenance and construction of one of the largest highway programs in the country.

Schmidt has been serving as acting secretary ever since the death of Ray F. Smock. In addition he has carried on his duties as chief engineer, a post he had held since March 1, 1947.

Schmidt has been affiliated with the department since February of 1939 when he was appointed district engineer in charge of the Pittsburgh district.

It was his planning that resulted in the Penn-Lincoln Parkway which carries routes 22 and 30 into and through

EDWARD L. SCHMIDT newly named Pennsylvania secretary of highways.

Pittsburgh (ENR Feb. 7, p. 44), and he has shown similar enthusiasm and persistence in bringing many other major highway projects throughout the state from planning board to reality. He has supported the planned highway which bypasses cities and towns and has always favored a statewide highway net that will provide for present and future needs.

During Schmidt's association with the department its construction program has been the largest in the history of the state.

Now 67, he was born in Pittsburgh. From 1916 to 1939 he worked for Allegheny County, Pa., in various positions in the county roads department eventually achieving the positions of chief engineer of roads and chief engineer of planning.

President of parking group appoints new assistant

Robert H. Blundred, former staff member of the American Municipal Association, has been appointed assistant to the president of the National Parking Association.

The association was organized last September. Its primary objective is to assist in determining and solving the parking requirements of cities suffering from growing pains.

Blundred has had a long and varied career in various local government positions and interests. He is the author of many books and articles dealing with municipalities and the federal government.

(*Continued on next page*)

HOW TO MAKE 1 CONCRETE VIBRATOR DO THE WORK OF 2-

A prominent user of Vibro-Plus Internal Vibrators says one Vibro-Plus does the job of two ordinary vibrators. He says his concrete tests very high—and costs substantially less. Vibro-Plus will save money for you, too—cutting your concrete time and labor costs up to 60%. There are gasoline, electric and pneumatic models (with shafts and heads all interchangeable). All three deliver vibrating frequencies of from 11,000 to 15,000 per minute... yet operating and maintenance costs are low. Write today for bulletins and nearest distributor.

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A COMPLETE LINE FROM ONE SOURCE TO MEET ANY REQUIREMENTS

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Exclusive with Servicised. Lowest cost non-extruding joint filler. 80% recovery after compression. Low moisture absorption. Readily handled without breakage.

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For positive joint filling. Specially treated to expand 50% beyond original thickness after compression to keep joint filled under contraction which opens space to more than original size.

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Forms an easily compressible cushion. Highly waterproof, low in cost. Made in 5 thicknesses in any length or width. Formed between two sheets of asphalt saturated felt paper which increases strength and rigidity, improves handling.

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Blends with color of concrete. For use in architectural concrete structures such as bridges, viaducts, etc., where black color of ordinary fillers would be objectionable. Fully resilient —non-extruding.

CORK
High recovery factor (95%) after compression, non-extruding qualities and light color make Cork Joint Filler ideal for use in flood walls, outlet works and spillways, sewage treatment plants, filtration plants and bridge construction.

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OF USABLE INFORMATION IN YOUR
BUCKET-SAVER BOOKLET

IT TELLS YOU...

HOW TO SAVE YOUR BUCKET. Among the many "bucket saver" suggestions are a list of "do's" and "don'ts" on the use and abuse of clamshell buckets; tips on how to prolong cable life; common operating mistakes that make bucket lips bow in or bend out.

HOW TO GET THE MOST FROM YOUR BUCKET. "How to Reeve the Bucket for Maximum Efficiency" is illustrated and described—one page is devoted to instructions for operators.

HOW TO REPAIR BUCKETS. Methods of renewing the cutting edges of worn bucket lips include special welding precautions. This section contains instructions for removing and replacing ball bearings in lever arm sheaves, lubrication instructions, and many other practical hints for care and maintenance.

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Men & Jobs . . .

Rust Engineering Company announces two promotions

Charles D. Haxby and S. W. Calloway have been elected vice-presidents of The Rust Engineering Company of Pittsburgh, Pa., by the Board of Directors.

Before their promotions, Calloway had been manager of proposals and estimates, while Haxby was general construction superintendent.

Calloway was born in Pittsburgh and educated at Carnegie Institute of Technology. He joined the Rust company after some years as an active engineer in 1935. Haxby is a native of Iowa and has a degree in civil engineering from Iowa State College. He has been a member of the firm since 1929.

Careers . . .

• **Appointed—F. Spencer Weber** has been admitted to the consulting firm of Hazelet & Erdal as an associate, attached to its Cincinnati office. . . **Robert Kennedy,** principal engineer in the Chicago office, has also been advanced to the status of associate. . . **W. D. McCully** has been named to take charge of the utility construction department for R. H. McManus & Co., Detroit, Mich., and McManus & McCarthy, Inc., Cincinnati, Ohio . . . Formerly chief highway engineer of the Nebraska highway department, **R. F. Weller,** has become general engineer for the Denver regional office of the U. S. Civil Defense Administration . . . Creation of a position of traffic control and safety within the Mississippi State Highway Department has been announced by Director **T. C. Robbins.** Named to fill this new post is **A. M. White,** who has been assistant maintenance engineer . . . **William O. Parker,** now planning director for the city of Austin, Tex., has been appointed planning director of San Antonio, Tex . . . **C. O. Schofield,** project engineer for the city-county flood control project at Wichita, Kan., has resigned to take a position with Gilboy & O'Malley, consulting engineers. His work will take him to England . . . Succeeding **Col. J. H. Skeggs** as assistant California state highway engineer in charge of ten-county District IV in San Francisco is **W. B. Booker** of San Francisco . . . The Federal Housing Administration announced the appointment of **W. Withers Adickes** as state FHA director in South Carolina. . . **Freeman B. Strickland,** Atlanta banker, has

(Continued on next page)

been named chairman of the newly created Georgia Toll Road Authority. . . **Seelye Stevenson Value & Knecht**, consulting engineers of New York City, announce the affiliation with them of **Louis A. M. Bushnell**, formerly Lt. Col. of the Corps of Engineers, Atlantic District . . . A partnership consisting of **H. E. Bovay, Jr., Bennett W. Burns, Charles A. Lawler, J. Wayne Holland**, and **Richard B. Robertson** has been formed in Houston, Tex., to practice consulting engineering under the name of H. E. Bovay, Jr. . . . Effective July 1, **Prof. Malcolm S. McIlroy** will be assistant dean of the College of Engineering, Cornell University, Ithaca, N. Y. . . . **James E. Clyde, P. E.**, has joined the firm of **O'Brien and Gere**.

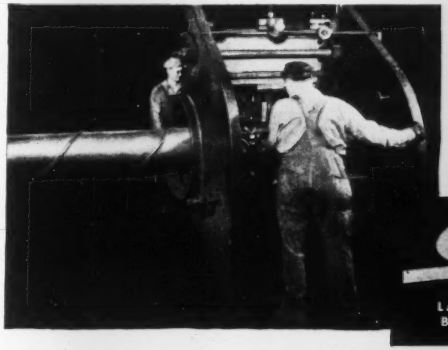
• **Elected**—**J. N. McComb**, Controller, Goulds Pumps, Seneca Falls, N. Y., was elected president of the Hydraulic Institute at its annual meeting at Absecon, N. J., it was announced by **Frank P. Anderson**, Secretary . . . The Associated General Contractors announced a new slate of officers. **A. S. Horner, president; C. P. Street**, of McDevitt and Street Co., Charlotte, N. C., vice-president; **W. M. Werner**, Shreveport, La., chairman, building contractor's division; **F. W. Heldenfels, Jr.**, Corpus Christi, Tex., chairman, highway contractor's division; and **E. P. Coblintz**, Baltimore, Md., chairman of the heavy construction and railroad contractor's division.

• **Honored**—A unique and signal honor was paid to 44 members of the excavating crew of the new 40-floor Republic National Bank Building in Dallas, Tex., when they were awarded certificates of merit at a brief ceremony held on the building site . . . **Emil F. Norelius**, consulting engineer at the Springfield, Ill., Allis-Chalmers Manufacturing Co. plant, has been awarded a certificate of appreciation for patriotic civilian service to the Department of the Army. The certificate cites Norelius for "his service on the technical, divisional, intelligence committee, joint chiefs of staff during World War II." . . . The Department of Commerce's exceptional service gold medal and citation has been given to **B. P. McWhorter** and **Arthur C. Clark** both of bureau of public roads.

• **Retired**—**George I. Hayward** has resigned as district engineer for the Northern Pacific Railway Co. at Seattle, Wash., after 46 continuous years of service.

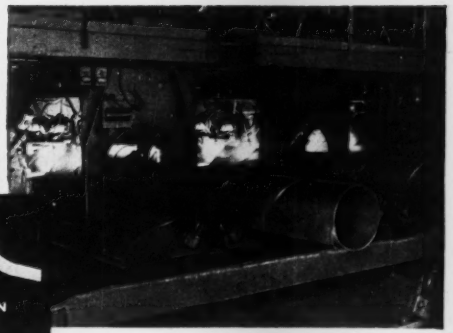
How NAYLOR Light-weight Pipe is built to take it

Here is the picture story of how Naylor creates a light-weight pipe for heavy-duty service.



In this operation, the Naylor pipe machine forms sheet into a spiral, lock-seamed pipe. This process creates a structure that is pipe before it is welded. As shown in the sketch of a lateral section before welding, the lockseam carries the structural load.

Illustrated here is the Naylor automatic welding process which welds the lock-seamed spiral to the wall of the pipe. This step provides a positive seal as shown in the lateral-section sketch after welding.



Because the lockseam carries the load and the weld is relieved of any strain, Naylor pipe provides the practical answer for lines that must stand up in rugged service in the construction field.

Write for Bulletin No. 507

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Wire Rope Blocks

Removal of one pin opens block to insert or remove cable.

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Here is a steel block that offers the desired combination of light weight and great strength. Sheave and side frames are made of wear resistant alloy steel and the sheave is recessed into the frame so there can be no binding of the rope. The Durolite design saves wear both on the block and the rope.

Made with either bronze or roller bearings in all sizes from 6-inch to 42-inch.

Write for prices and bulletin.

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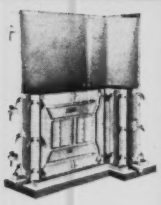
Save manpower time and material



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OBITUARIES

Edward A. Dougherty, 65, chief engineer of the New York Central system west of Buffalo, died Feb. 27. With the railroad since his graduation from Columbia University, he became chief engineer in 1945. Among major improvements which Mr. Dougherty helped to supervise in later years were the construction of the new passenger station at Toledo, the lakefront docks and terminal at Toledo and the Syracuse crossing elimination. He was a brother of Richard E. Dougherty, vice-president in charge of engineering of the New York Central System until his retirement in 1948 and now a consulting engineer in New York.

George W. Mason, 92, died at Catlettsburg, Ky., Feb. 18. He was a prominent Eastern Kentucky civil engineer. He took part in the preliminary survey and served as an engineer in construction of the Chesapeake & Ohio Railway between Huntington, W. Va. and Cincinnati. He also was well known as a bridge building contractor. A resident of Catlettsburg 85 years, he was born in Nebraska and was a graduate of Kenyon College, class of 1880. He had been active until about 18 months ago, when he retired.

Frank T. Ahearn, 55, town engineer of Arlington, Mass., died Feb. 25. He had been with the engineering department for 38 years.

Henry T. Brown, 84, city parks engineer in Rochester, N. Y., for more than 40 years, died Feb. 24. He planned and directed the layout of three of the city's largest parks.

Morgan D. Hayes, 80, a civil engineer who in 1941 planned a new distribution system for the Philadelphia, Pa., water works, died Feb. 23 in Rochester, N. Y. Mr. Hayes formerly was city engineer in Rochester and had served as engineer for both the War Production Board and the State Public Service Commission.

Henry S. Harris, 86, a partner with his father and brother in the firm of W. T. Harris & Sons, general contractors, Halifax, N. S., died Feb. 20. The business had operated for over 65 years. He was last surviving partner.

Frank M. Hanley, 58, for years superintendent of the pavement and asphalt division, Department of Streets and Sewers, St. Louis, Mo., died Feb. 20.

C. U. Smith, 67, civil engineer, and former harbor manager and chief port engineer at Milwaukee, Wis., died Feb. 25 at Lindsay, Calif. He helped to make Milwaukee's harbor one of the best on the Great Lakes. During World War I he won the French Croix de Guerre and American citations for bridge building overseas while serving with the 107th Engineers, 32nd Division. He served the Milwaukee harbor commission from 1926 to 1941. When he went to Lindsay to start an olive and citrus ranch, he also served as city engineer and building inspector there.

Jesse H. Proctor, 51, of Durham, N. C., district engineer for the North Carolina Highway Department, died Feb. 28. He took his engineering degree at Duke University and N. C. State College, and had been with the highway department since graduation from the latter in 1921.

Ernest A. Truran, 76, retired structural engineer for the Massachusetts Department of Public Works, died Feb. 21, in Wareham. He was a former engineer for the American Bridge Co. and the New York Central Railroad.

George E. Martin, 67, civil engineer, Ottawa, Ont., died Feb. 21. A 1909 graduate of McGill University, for 42 years he was superintending engineer for the Canadian Department of Public Works in the Maritime provinces.

John Hopkins, 69, of Laurel, Md., a civil engineer in the highway transport research branch of the U. S. Bureau of Public Roads, died Feb. 19. A 1902 graduate of Swarthmore College, he was with the Pennsylvania R.R. until 1915, when he went to Pittsburgh as an engineer with the Jones & Laughlin Steel Co. In 1924 he joined the Department of Commerce.

Jacob Ecker, 80, of Oak Park, Ill., a hydraulic engineer, died Feb. 18. He had installed waterworks in many municipalities in the Middle West. He had also installed and supervised all the pumps at the World's Columbian Exposition in Chicago in the summer of 1893.

John G. Irby, 64, a civil engineer formerly with the Texas highway department died at Ennis, Tex., Feb. 20.

Precision Action

CLEANS DITCH BOTTOM WITHOUT DESTROYING SODDED SLOPES!

HERE'S HOW a major railroad uses one of its several Gradalls to cut costs on a rather routine—but never ending—job.

With extreme accuracy, the Gradall cleans this 7½ foot drainage ditch without harming sodded slopes or disturbing the surrounding area. Completely replacing the hand labor previously required, the Gradall did the job quicker, more accurately, and at less cost.

Many similar excavating jobs—close to curbs, sidewalks, tree lawns, buildings, or around buried pipe or tanks—ordinarily require hand work in addition to machines. But the Gradall's positive down pressure and arm action insures such accuracy and neatness that hand labor is eliminated on nearly all such jobs.

The Gradall's remarkable precision, versatility, and maneuverability return big profits to construction men—cut costs for railroads and municipalities.

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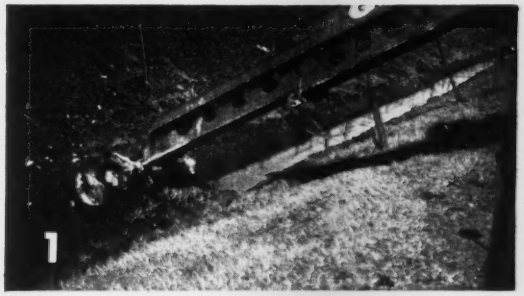


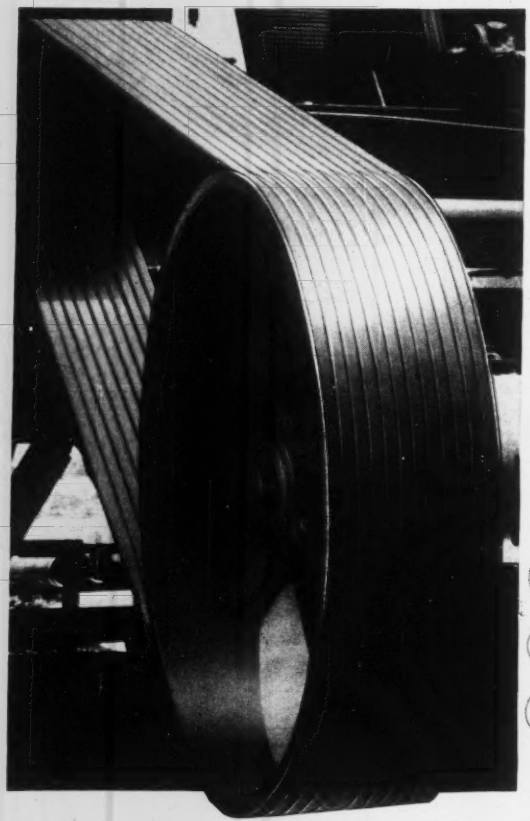
The 6 ft. wide, ½ cubic yard bucket starts its precision cut.

The hydraulic boom, working with the skill of a giant arm, takes a skim cut from the bottom of the back slope. The muck is cleaned from the bottom, and a skim cut taken from the lower end of the front slope—lifting it free without disturbing sod.

The Gradall swings around and wastes the muck.

The arm-action boom levels the waste evenly over the surface before returning for another cut.

GRADALL—THE MULTI-PURPOSE CONSTRUCTION MACHINE *with Controlled Down Pressure*



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1 Match them for length*

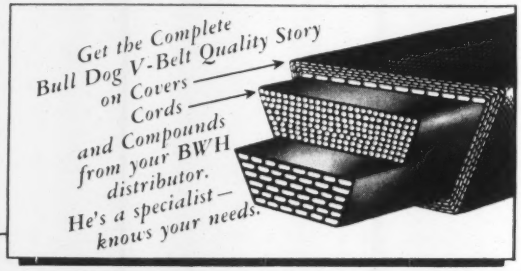
2 Match them in make*

3 Check sheaves for alignment and groove wear

4 Install Sets of Bull Dog V-Belts for Uniformity of Quality...

**Should* an individual belt fail, it is neither practical nor economical to replace it with a new belt. The new belt may be either shorter or longer than the remaining belts. If shorter, the excessive overload it must carry will cause early failure. If longer, it will not carry its share of the load, thus adding nothing to the life of the drive.

You can't be sure about length or compare hours worked unless you install new V-Belts by the set. You can't be sure of uniformity of quality unless you install Bull Dogs.



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Bids Asked—Low Bidders—Contracts Awarded—First Section

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.
ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *M. R. ROESSLER, Statistics*

NEW ENGLAND

BIDS ASKED—BUILDINGS

▲ **Mass., Braintree** — POWER PLANT — B.A. 3/19 — Town, Electric Light Dpt., 44 Allen St., East Braintree, electric power plant addn. $1,500,000. Chas. T. Main, Inc., 80 Federal St., Boston, engr. CD 7/24/51.

Mass., Scituate—SCHOOL—B.A. 3/20—Town, School Dpt., high school, remodeling incl. 2 wing addn. $825,000. Perry, Shaw, Hepburn, Kehoe & Dean, 31 St. James Ave., Boston, archts. CD 9/11.

▲ **Mass., Cambridge**—HOUSING—B.A. 4/3—Cambridge Housing Auth., 51 Inman St., 123 unit 3 story housing Proj. 3-3. $3,500,000. Plans deposit $100. Desmond & Lord, 6 Beacon St., Boston, archts. CD 8/24.

BUILDINGS

LOW BIDS AND CONTRACTS

Coty Constr. Co., Van Buren, Me. CA $548,606, est. $500,000. 50 HOUSING units, Proj. Maine 1-1, VAN BUREN, ME. Van Buren Housing Auth., Town Hall, Van Buren, Me. Bids Feb. 28. CD 2/5.

Bathelt Constr. Co., 50 Appleton St., Holyoke, Mass. CA $911,000. DINING HALL at University of Massachusetts, 7918-79-U7, AMHERST, MASS. State University of Mass., Office of Treasurer, Amherst, Mass. CD 2/7, under LB.

William T. Ohman, Main St., South Chatham, Mass. CA Approx. $570,000. 38 RESIDENCES, Ryders' Grove, Chathamport, CHATHAM, MASS. Stillwater Assoc., South Chatham, Mass. George Clements, Main St., Yarmouth, Mass., archt.

J. F. Rand & Son, 58 Sudbury St., Boston, Mass. CA $509,940. SCHOOL, Groton Rd., North Chelmsford, CHELMSFORD, MASS. Town Supt. Schools, H. Morton Jeffords, Billerica Rd., Chelmsford, Mass. CD 2/20, under LB.

▲ **Clinton Housing Auth.,** J. W. McMahon, chn., Municipal Bldg., 242 Church St., Clinton, Mass., cancelled bids to have been opened Feb. 29. 100 housing units, Flagg St., Proj. 21-1, CLINTON, MASS. $1,000,000. CD 1/28.

Campanelli Bros., 58 Elm St., East Bridgewater, Mass. CA Approx. $600,000. 58 RESIDENCES, Spring Valley, Terrace, Wedgewood and Weatherfield Rds., Natick, MASS. Natick Builders Co., Inc., 728 Worcester St., Natick, Mass.

▲ **Westcott Constr. Co.,** 42 Weybosset St., Providence, R. I., CA. $2,175,521, PHA RI-2-2. Constr. 2, low rent HOUSING, Crook Manor, PAWTUCKET, R. I. Pawtucket Housing Auth., 560 Prospect St., Pawtucket, R. I. Bids Jan. 30, awarded Feb. 25. CD 2/6 under LB.

MIDDLE ATLANTIC

BIDS ASKED—BUILDINGS

N. J., Trenton—SCHOOL—B. A. 4/2—Hamilton Twp. Bd. Educ., 2069 Greenwood Ave., Junior High School, Hamilton Ave. and Klockner Rd., $975,000. Plans deposit $25. Herman L. Mack, 2428 Liberty St., archt. CD 11/15.

SOON LETS CONTRACT—BUILDINGS

Pa., Phila.—HOME—Horace W. Castor, archt., 117 S. 17 St., soon lets contract home addn. for Baptist Home of Phila., Roosevelt Blvd. and Pennypack Circle, $600,000. Sauter & Castor, 1411 Walnut St., engrs. CD 12/19.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

NEW JERSEY—State Hy. Dpt., 1035 Parkway Ave., Trenton.

Franklin Contg. Co., 12 Central Ave., Newark, N. J., CA $556,087, constr. Route 3 Sect. 1 D, overpass bridge and approaches on Paterson Plant Rd., Secaucus, Hudson Co. Bids Feb. 14, awarded Feb. 25. CD 1/23.

▲ **Eastern Engineering Co.,** 4 N. North Carolina Ave., Atlantic City, N. J., LB, $2,528,893, general contract;

Turbine Equipment Co., 75 West St., New York, N. Y. LB $158,164, furnishing, installing pumping equip.;

Robert Blyth, 140 Exton Ave., Trenton, N. J., LB $144,000 electrical work;

Schoeller Plumbing Co., 998 Lamberton St., Trenton, N. J., LB $59,488, heating and ventilating work;

Schacht Steel Constr. Co., Inc., 1841 Broadway, New York, 23, N. Y., LB $74,480, structural steel work all in connection with water filtration plant addn., Calhoun St. and Delaware River, TRENTON, N. J. City, Dpt. P. Wks., Water Div., City Hall, Trenton, N. J. Bids Feb. 28. CD 2/1.

A. J. Stormer & Son, 2215 9 Ave., Atoona, Pa., LB $666,764, sewerage system;

Boyd Kline, Bloomsburg, Pa., LB, $314,017 disposal plant, SHIPPENSBURG, PA. Shippensburg Boro Auth., Municipal Bldg., Shippensburg, Pa. Bids Feb. 19. CD 1/28.

BUILDINGS

LOW BIDS AND CONTRACTS

Stratford-on-the-Highlands Homes, c/o Alvin Cassens, Jr., archt., 145 S. Franklin Ave., Valley Stream, N. Y., Owner Builds, $800,000, 52 HOUSES on tract on Highland Ave., GLEN COVE, N. Y.

▲ **Gotham Constr. Co.,** 501 Fifth Ave., New York 17, N. Y. CA $1,000,000. 4 story Southeast Pavilion HOSPITAL addn., NEW YORK, N. Y. Montefiore Hospital, Bainbridge Ave. and 210 St., New York 67, N. Y. Schuman & Lichtenstein, 369 Lexington Ave., New York 17, N. Y., archts.

Willow Ridge Home, c/o J. J. Gloster & Sons, archts., 225 W. 57 St., New York, 19, N. Y. Owner Builds, $520,000 13 HOUSES on tract at Ivy Hill Rd. off Woodmere Blvd., WOODSBURGH, N. Y.

B. J. Lucarelli & Co., 22 Orchard St., Jersey City, N. J., LB, $892,000, Walter J. Buzby HOMES, ATLANTIC CITY, N. J., Atlantic Housing Auth., 2311 Fairmount Ave., Atlantic City, N. J. Bids Feb. 14. CD 1/23.

Haworth Manor Homes, c/o Frederick W. Harsen & Lawrence R. Moon, archts., Summit St. and East Railroad Ave., Tenafly, N. J. Owner Builds. $1,750,000. 75 HOUSES on tract at Prospect Ave. near Knickerbocker Rd., HAWORTH, N. J.

Gregory Plaza Homes, c/o Leonard G. Feinen, archt., 320 Lincoln Ave., Hasbrouck Heights, N. J. Owner Builds. $850,000. 52 HOUSES, on Spring Valley Ave., MAYWOOD, N. J.

Fairhaven Homes, c/o Leonard G. Feinen, archt., 320 Lincoln Ave., Hasbrouck Heights, N. J. Owner Builds, $450,000. 35 HOUSES on tract on Park Ave., MIDLAND PARK, N. J.

Hyman Korman, Inc., 6401 Castor Ave., Phila., Pa., Separate Contracts. Approx. $560,000. RESIDENTIAL DEVELOPMENT, Lexington Ave. and Brockerhaust St. and Lister St., PHILA., PA.

▲ **Gardens Constr. Co.,** 2107 N. Charles St., Baltimore, Md. LB $2,879,826, est. $1,250,000. 1 and 2 story, 40x470 ft. with 4 wings, 32x160 ft., brick, block, concrete, steel bldg. and 85x105 ft. boiler plant, Patuxent Institute for Delinquent Defectives, JESSUPS, MD. State, Dpt. P. Imprvs., 506 Park Ave., Baltimore 1, Md. Bids Feb. 21. CD 2/1.

▲ **Ring Eng. Co.,** 1200 18 St. N.W. Wash., D. C., CA $1,500,000, HOUSE OF WORSHIP, McComb St. and Massachusetts Ave. N.W., WASH., D.C., Washington Hebrew Congregation, 816 8 St. N.W., Wash., D. C. Karsunky, Weller & Goock, 2011 K St. N.W., Wash., D. C., engrs. W. Dixon, c/o contractor, archt.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Lat.n America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects invloved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

SOUTH

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Pineland Telephone Co., Swainsboro, Ga., Owner Builds, $652,000, Telephone lines, SWAINSBORO, GA.

† **Bradford Builders, Inc.,** 1101 Lincoln Road Bldg., Miami Beach, Fla., CA. $515,790, technical and humidity control warehouse, vehicle maintenance shop, carpenters shop, etc. at Patrick Air Force Base, Inv. 52-106, COCOA, FLA. U. S. Eng., P.O. Box 4970, Jacksonville, Fla., Bids Feb. 19. CD 2/28, under LB.

† **Texas Constr. Co.,** P.O. Box 1384, Dallas, Tex. CA $549,738. Bogue Chitto and Pools Bluff Sills, Pearl River, Inv. 52-39, LOUISIANA and MISSISSIPPI. U. S. Eng., P.O. Box 1169, 2301 Grant St., Mobile 7, Ala. Bids Feb. 21. CD 1/21.

▲† **W. R. Aldrich & Co.,** Box 147, Alexandria, La. LB $1,138,013. runway, taxiway extension, Alexandria Municipal Airport, Inv. 52-26, ALEXANDRIA, LA. U. S. Eng., 300 Broadway, Little Rock, Ark. Bids Feb. 26. CD 1/31.

TENNESSEE—State Hy. Dpt., Nashville,

Griffitts-Bell Constr. Co., 5119 Kingston Pike N.W., Knoxville, Tenn. CA, $802,646, widen, resurf. 13 mi. Chapman Hy. between Sevier and Cusick, Sevier Co.

C. F. Rule Constr. Co., 217 13 Ave. N., Nashville, Tenn. CA $515,345. sewage disposal plant, COOKEVILLE, TENN. City, City Hall, Cookeville, Tenn. CD 2/26, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

† **American Constr. Co.,** 261 Constitution Ave., Wash., D. C. CA. $676,400. civilian male and female DORMITORIES, NOY 70545, DAHLGREN, VA. Potomac River Naval Command Naval Gun Factory, Wash. 25, D. C. Bids Feb. 6, Awarded Feb. 21. CD 2/11 under LB.

Abbott & Ritchie, 318 W. Cary St., Richmond, Va., CA. $747,000, HOUSING Projects VA 5-2 and VA 5-3 HOPEWELL, VA. Hopewell Redevelopment & Housing Auth., Hopewell, Va. Bids Feb. 21. CD 1/25.

▲ **George W. Kane,** Greensboro, N. C., CA. $1,437,562, CHAPEL, CHURCH, REYNOLDA, N. C. Wake Forest College, O. M. Mull, Shelby, N. C. Bids Feb. 25. CD 1/30.

▲ **Forest Park Corp.,** c/o Benjamin Surasky, Aiken, S. C. Owner Builds. $6,000,000. 600 RESIDENCES, AIKEN, S. C.

▲ **Cecil's, Inc.,** Spartanburg, S. C. CA $1,655,000. HOUSING, Proj. SC 2-4, GREENVILLE, S. C. Greenville Housing Auth., Greenville, S. C. Bids Feb. 27. CD 1/25.

▲ **Algernon Blair,** First National Bank Bldg., Montgomery, Ala., CA. $2,000,000, 300 APARTMENT UNITS, ATLANTA, GA. Bolton Estates, c/o contractor.

Strother-Barge Co., 189 Cain St. N.E., Atlanta, Ga., CA $500,000, WAREHOUSE, ATLANTA, GA. Atlantic Steel Co., Mecaslin St. N.W., Atlanta, Ga.

Smith & Jones, 936 W. Peachtree St., Atlanta Ga., CA, $900,000, 125 HOUSING units, MARIETTA, GA. Marietta Housing Auth., Marietta, Ga. Bids Feb. 28. CD 2/5.

Rood Constr. Corp., Coral Gables, Fla., CA. $616,339, 83 HOUSING units, MERRITT ISLAND, FLA. Brevard County Housing Auth., 123 Palmetto Ave., Merritt Island, Fla. Bids Feb. 28. CD 1/20.

▲ **G. A. Paul Constr. Co.,** 1 Bonita Ave., Birmingham, Ala., CA, $1,779,000, 272 HOUSING units, ANNISTON, ALA. Anniston Housing Auth., Anniston, Ala. Bids Feb. 27. CD 1/20.

▲† **Jordan Contg. Co.,** Box 1179, Columbus, Ga., CA. $1,451,719, semi-permanent type troop HOUSING Inv. 52-36, near Anniston, FORT MCCLELLAN, ALA. U. S. Eng., P.O. Box 1160, Mobile 7, Ala. Bids Feb. 21. CD 1/11.

Building Service Co., West Point, Miss. CA $544,480. HOSPITAL, WEST POINT, MISS. Memorial Hospital Foundation, West Point, Miss. CD 2/12, under LB.

Romero & Theall, Youngsville, La. CA $549,000. HOUSING, Projs. LA 34-1 and LA 34-2, ABBEVILLE, LA. Abbeville Housing Auth., Abbeville, La. Bids Feb. 23. CD 1/29.

▲ **R. P. Farnsworth & Co., Inc.,** P.O. Box 2029, Baton Rouge, La. CA $1,181,525. 170 HOUSING units, Proj. LA 27-1 and LA 27-2, NEW IBERIA, LA. New Iberia Housing Auth., New Iberia, La. Bids Mar 6. CD 2/11.

Holliday & Meyers and David-Nussmeyer Assoc., Evansville, Ind. Owner Builds. $600,000. 94 RESIDENCES, HENDERSON, KY.

CEMENT GUN COMPANY RESTORES CAUSEWAY WITH "GUNITE"

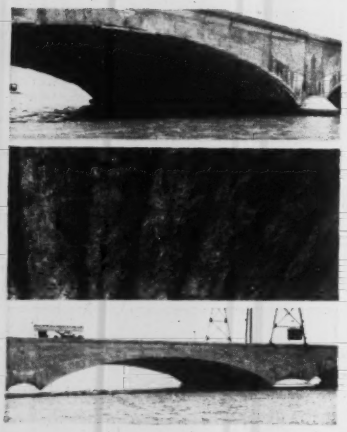

Photo at top illustrates the advanced stage of disintegration which ruined the underside of the arch and spandrels of a Texas Causeway. Cement Gun Company crewmen removed crumbling concrete and anchored reinforcing mesh in place. "GUNITE", sprayed on the concave arch, not only repaired the damage but also strengthened the Causeway and added to its original beauty.

This Causeway is typical of many types of structures we have reintegrated with "GUNITE". We have also illustrated and described many others for you in our 64 page Bulletin A2400. We'll be glad to send you a free copy at your request. Perhaps we can help solve some of your repair problems.

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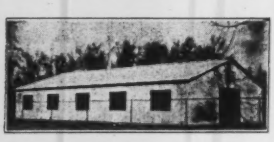

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▲ Glenn D. Whitehurst, 1716 Marlow Rd., Louisville, Ky. Owner Builds $1,000,000. 80 RESIDENCES, LOUISVILLE, KY. CD 2/27.

Perkins & Gray, 1125 Greenup St., Ashland, Ky. LB $507,000. general contract 13 BUILDINGS, incl. 74 dwelling units, administration and maintenance bldg., Proj. Ky 13-1 and Ky 13-2, PARIS, KY. Paris Municipal Housing Comm., People's Deposit Bank Bldg., Paris, Ky. Bids Feb. 27. CD 2/6.

Hargett Constr. Co., 113 Walton Ave., Lexington, Ky. CA $623,614. 76 DWELLING units, Memorial Park, Ky 19-1; 24 DWELLING units, Tyler Banks, Ky 18-2, WINCHESTER, KY. Winchester Housing Comm., Winchester, Ky. CD 2/11, under LB.

▲ Helrich Constr. Co., 2100 Airlor Ave., Knoxville, Tenn., CA, $1,518,567, 200 units HOUSING Project Tenn 20-1 and 20-2, MURFREESBORO, TENN., Murfreesboro Housing Auth., 23 Masonic Bldg., Murfreesboro, Tenn. Bids Feb. 28. CD 2/8.

MIDDLE WEST

BIDS ASKED—BUILDINGS

Mich., Flint—HEATING PLANT—B.A. 3/25—State, A. N. Langius, dir. State Bldg. Dpt., 116 W. Michigan Ave., Lansing, brick, steel, concrete central heating plant, Michigan School for Deaf, $500,000. Extended date. O'Dell, Hewlett & Luckenbach, 2300 Dime Bldg., Detroit, archts.-E. R. Little Co., 1806 Kales Bldg., Detroit, engr. CD 2/28.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ MICHIGAN—State Hy. Dpt., 222 Townsend St., Lansing, Zone 13.

Carl Goodwin & Sons, Allegan, Mich. LB $477,360. grading, drainage structures 1.552 mi. US-31 relocation, FI 119 C12, Berrien Co. Bids Feb. 20. CD 2/5.

MICHIGAN—State Hy. Dpt., 222 Townsend St., Lansing, Zone 13.

Sargent Constr. Co., 2840 Bay Rd., Saginaw, Mich. CA $597,091, est. $130,000. c. conc. 7.784 mi. M-50, F 46-31 C5, (F 209 51 Part 1, F 58-29 C1 (F 209 51, Part 2 Lenawee and Monroe Counties. CD 2/27, under LB.

▲ Consumers Power Co., C. A. Mulligan, mgr., Battle Creek, Mich. Owner Builds. $1,000,000. power expansion, incl. sub-station imprvs., power supply and electric distr. lines, incl. completion 44,000 volt line to Gull Lake, BATTLE CREEK, MICH.

C & C Constr. Co., 2001 E. Pontiac St., Fort Wayne, Ind. CA $545,650, est. $561,000. sewage disposal plant treatment facilities, Carp River, MARQUETTE, MICH. City, Marquette, Mich. CD 2/6, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Linden Development Corp., 74 E. Gay St., Columbus, O. Owner Builds. $500,000. sixty 1½ story frame DWELLINGS 1100 and 1200 blocks of 25 and 26 Aves., COLUMBUS, O.

† Friebel-Hartman, Inc., Shelby, O. CA $604,457. steel, concrete Equipment PROCESSING BLDG., Marion Engineering Depot, MARION, O. U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va. Bids Feb. 13. CD 1/3.

Comte Constr. Co., 912 Summit St., Toledo, O., CA general contract;

E. W. File Plumbing & Heating Co., Lima, O., CA heating and plumbing;

Bigley Electric Supply Co., Findlay, O., CA electrical work 2 story classroom sect., Lake Twp. HIGH SCHOOL, MILLBURY, O. Bd. Educ., Lake Twp. School Dist., Millbury, O. Total bids $653,334. Bids Jan. 25. Awarded Feb. 5. CD 1/31, under LB.

Sherman Olson Co., 600 W. Jackson St., Chicago, 6, Ill., CA, $500,000, two FACTORY Addns., CHICAGO, ILL. Delta Star Electric Co., 2701 W. Fulton St., Chicago, Ill. Awarded Feb. 18. CD 1/16.

Dahl-Stedman Co., 7 S. Dearborn St., Chicago 3, Ill., CA $500,000, Dial EXCHANGE Bldg., 7550 S. Stewart Ave., CHICAGO, ILL. Illinois Bell Telephone Co., 212 W. Washington St., Chicago 6, Ill. Holabird & Root & Burgee, 180 N. Wabash St., Chicago 1, Ill., archts. Awarded Feb. 18.

Kroening Eng. Corp., 4500 W. Mitchell St., Milwaukee 14, Wis., CA, $588,665, 60 DWELLING Units, Proj. Wisc. 8-1, SOUTH MILWAUKEE, WIS. Housing Auth., 931 Milwaukee Ave., South Milwaukee, Wis., Feb 4. CD 2/12, under LB.

J. P. Cullen & Son, 330 E. Eastern Ave., Janesville, Wis., CA, $882,631, general contract County HOME and HOSPITAL, VERONA, WIS. Dane Co., Court House, Madison, Wis. Bids Feb. 14. CD 2/29, under LB.

▲ Mutual Savings & Loan Assn., Bay City, Mich. Owner Builds. $2,500,000. 255 brick, frame single HOUSES, South End, BAY CITY, MICH.

Henry W. DeKoning Constr. Co., 320 Municipal Court Bldg., Ann Arbor, Mich. CA $797,525. 1 story, 295x340 ft. Junior High SCHOOL, Riverview Ave., MONROE, MICH. City, Bd. Educ., Monroe, Mich. CD 2/26, under LB.

Henry A. Jackwerth, Trenton, Mich. Owner Builds. $800,000. 100 frame HOMES, Sibley Park Section, TRENTON, MICH.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

▲† Tex., Victoria—AIR BASE—B.A. 3/20—U. S. Eng., 606 Santa Fe Bldg., Galveston, base antenna farm, Approx. $60,000; academic bldg.; 3 BOQ bldgs., Approx. $500,000; 9 airmen's quarters dormi-

tories, Approx. $100,000; two 500-man each mess halls, $500,000; two 49,600 sq. ft. supply warehouses, $375,000; hydrogen and oxygen storage bldg.; masonry cold storage and meat cutting shop, all foregoing Inv. No. Eng 41-243-52-82; sewage disposal sys., $60,000; gas and electrical distr. sys. $60,000; water distr. sys., $35,000; gas fueling station incl. all appurtenances incl. 20,000 gal. fuel storage, Approx. $60,000; 113,000 sq. yd. road resurf., 28,000 sq. yd. road constr., 13,000 sq. yd. parking area, $60,000; construction of underground 150,000 gal. storage tank and 20,000 bbl. above ground storage, lube oil storage, $100,000, all foregoing Inv. No. Eng. 41-243-52-81, at Foster Air Force Base. CD 1/9.

BIDS ASKED—BUILDINGS

▲ **Tex., Dallas**—HOUSING—B.A. 3/24—Dallas Housing Auth., 2525 Lucas Dr., Tex. 9-11-D, 500 housing units for total 56 masonry bldgs. $3,750,000. Plans deposit $100. Associated West Dallas Housing Architects, c/o owner, archts. CD 12/2/49.

▲ **Mo., St. Louis**—HOUSING—B.A. 3/27—St. Louis Housing Auth., David Murphy, acting exec. dir., 901 Washington Ave., Zone 1, 1,736 dwelling units, incl. twenty 11 story, brick, rein.-con. apartment bldgs., demolition certain bldgs., etc. Proj. Mo.-1-4. Extended date. Hellmuth, Yamasaki & Leinweber, Inc., 1313 International Office Bldg., 722 Chestnut St., Zone 1, archt. CD 1/22.

▲ **Tex., Galveston**—HOUSING—B.A. 3/30—Housing Auth. City of Galveston, City Hall, 147 dwelling units TEX 17-3, $1,102,500. Plans deposit $25. R. R. Rapp, Price & Stafford, 417 Guaranty Bldg., Galveston, and Arne G. Engberg, 3819 Fannin St., Houston, Tex., archts. CD 1/16.

▲ **Tex., Freeport**—LABORATORY—B.A. 3/31—Dow Chemical Co., Freeport, 8 bldg., 57,000 sq. ft., unit research laboratory center, $2,600,000. Bid date changed. Howard & Johnson, Scanlan Bldg., Houston, Tex., engrs. MacKie & Kamrath, 2715 Ferndale St., Houston, Tex., archts. CD 9/19.

▲ **Tex., Freeport**—RESEARCH LABORATORY— B. A. 4/2—Dow Chemical Co., Freeport, 8 bldg. unit research laboratory. $2,600,000. MacKie & Kamrath, 2713 Ferndale St., Houston, archts. Howard & Johnson, Scanlan Bldg., Houston, engrs. CD 3/3.

HEAVY CONSTRUCTION
LOW BIDS AND CONTRACTS

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul.

Okes Constr. Co., E. 1501 First National Bank Bldg., St. Paul, Minn. LB $504,825. paving 9.6 mi. between Balaton and West Lyon Co. line, Lyon Co. Bids Feb. 15. CD 1/30.

▲ **IOWA**—State Hy. Comn., Ames.

Bushman Constr. Co., 4638 J. C. Nicholas Parkway Kansas City, Mo., LB $205,131, paving 3.832 mi. F-71 (8); LB, $329,801, paving 6.135 mi. F-914 (2), both Washington Co.;

Lee & Johnson, Inc., 215 Insurance Exchange Bldg., Sioux City, Ia., LB, $325,396 stabilized base and bit. 12.317 mi. F-747 (5), Buena Vista Co.; LB $170,738; stabilized base and bit. 7.884 mi. F-809(), Div. 1, Sac Co.;

Iowa Road Bldg. Co., Fairmont, Minn., LB, $140,441 stabilized base and bit. 8.008 mi., S-723 (2), Div. 2, Plymouth Co.; LB, $252,649, stabilized base and bit. 14.636 mi. S-192 (4), Div. 2, Plymouth Co.;

Central Constr. Co., Indianola, Ia., LB, $75,541, paving 0.427 mi. P-598, Bremer Co.;

Booth & Olson, Inc., 529 Insurance Exchange Bldg., Sioux City, Ia., LB, $463,938, paving 7.819 mi. F-341 (3) Cass Co.;

Hallett Constr. Co., Crosby, Minn., LB, $372,454, paving 6.557 mi. F-565 (6) Linn Co.;

Fred Carlson Co., Decorah, Ia., LB, $755,270, paving 16.172 mi. F-398 (2), Winnebago and North Counties;

E. M. Duesenberg, Inc., Clear Lake, Ia., LB, $135,632, grading 6.836 mi. F-888 (2), Cerro Gordo Co.;

Myers Bros., Inc., Ft. Atkinson, Ia., LB, $70,637 grading 8.783 mi. S-188 (4), Chickasaw and Howard Counties. Bids Feb. 22. CD 2/6.

† **Cordon-Cunningham Co.**, 4229 Lafayette St., Omaha, Neb. CA $928,515. restoration flood protection structure and facilities, Argentine Unit, Part I, Sect. I, near Kansas City, Inv. 52-129, KANSAS. U. S. Eng., 601 Davidson Bldg., Kansas City, Mo. CD 2/20, under LB.

† **Peter Kiewit Sons Co.**, Airport Branch P. O., Wichita, Kan. CA $518,656. paving, site grading fencing at Smoky Hill Air Force Base, Inv. 52-32, SALINA, KAN. U. S. Eng., 601 Davidson Bldg., Kansas City, Mo. CD 2/14, under LB.

▲ **Anderson Bros. Corp.**, 707 N. Drennan St., Houston, Tex. CA. Approx. $18,690,000. laying 267 mi. 24 in. welded joint crude oil pipe line, McCamey to Cedar Valley near Austin;

Houston Contg. Co., 2707 Ferndale St., Houston, Tex., CA. Approx. $13,160,000. 187 mi. 24 in. welded joint oil pipe line from Cedar Valley near Austin to Houston Texas Ship Channel, TEXAS. Rancho Pipe Line System, c/o Shell Pipe Line Corp., Shell Bldg., Houston, Tex. Shell Pipe Line Corp., Shell Bldg., Houston, Tex., designers, const. overseer and line operators. CD 9/28, under CA.

▲ **Sun Pipe Line Co.**, M. Esperson Bldg., Houston, Tex., Own Forces. $1,550,000. 99 mi. crude oil feeder line, vicinity Snyder to West Texas Gulf line, southwest. TEXAS. CD 2/13.

▲ **Smith Contracting Corp.**, 205 N.W. 7 St., Fort Worth, Tex., CA $9,250,000, 175 mile 16 in. crude oil pipe line Corsicana to near Houston, TEXAS. Texas Pipe Line Co., Texas Co. Bldg., Houston, Tex. (Correction—cost). CD 2/19.

▲ **TEXAS**—State Hy. Comn., Austin,

T. R. Vardeman, Nacogdoches, Tex., LB $90,263, est. $75,000, grading, structures, base, surf. 9.285 mi.

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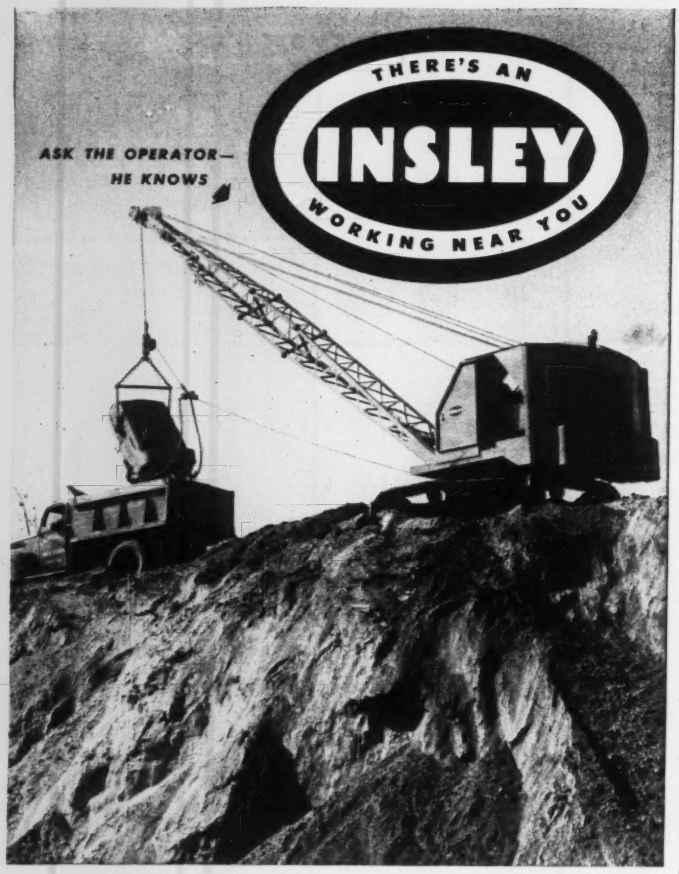

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Hy. FM 227, Houston Co.; LB $90,300, est. $75,000, grading, structures, base surf. 7.127 mi. Hy. FM 1645, Proj. 1655 (1), Shelby Co.;

Trotti & Thomson, Inc., P. O. Box 70, Beaumont, Tex., LB $226,128, est. $200,000, c. conc. pavement and Pine St. interchange 0.371 mi. Hy. U. S. 90, Proj. UI 56 (2), Jefferson Co;

Cooper & Woodruff and Tecon Constr. Inc., 222 Mays Bldg., Amarillo, Tex., LB $698,983, est. $680,000, grading, ext. structural, flexible base, hot mix b. conc. 27.911 mi. Hy. U. S. 70, Proj. F 568 (21) and (22), Hale Co.;

Gaylord Constr. Co., 806 Blodgett St., Houston, Tex., LB $87,742, est. $75,000, asphaltic paving 19.216 mi. Hy. U. S. 287 and 79, Proj. C 109-1 and 2-4 and 3, Anderson Co.;

Joe Davidson, Terrell, Tex., LB $210,586, est. $200,000. flexible base and asph. paving 12.253 mi. Hy. SH 243, Proj. C 522-2-7, Van Zandt Co.;

Bell, Braden, Barker & Gilvin, Inc., P. O. Box 2268, Amarillo, Tex., LB $144,140, est. $100,000. grading, structures, base, surf. 17.214 mi. Hy. FM 1731 and FM 1796 Proj. S 1574 (1), Parmer Co.;

Campbell & Kay, Tyler, Tex., LB $85,465, est. $75,000. grading ,structures base, surf. 10.141 mi. Hy. FM 1793, Proj. R 1759-1-1, Harrison Co.; LB $123,856, est. $75,000. flexible base, two course surf. tr. 5.764 mi. Hy. FM 787 and SH 105 T, Proj. S 1751 (1), Liberty Co.;

Pioneer Trucking & Constr. Co., Grapeland, Tex., LB $99,135, est. $75,000. flexible base, two course surf. tr. 6.722 mi. Hy. U. S. 76, Proj. F 327 (13), San Augustine Co.;

Dudley R. Cloud & Son Contractors, 1903 Transit Tower, San Antonio, Tex., LB $87,740, est. $75,000, grading, structures, base, surf. 6.621 mi. Hy. FM 953, S 1380 (1) DeWitt Co.;

South Texas Constr. Co., P.O. Box 3536, Corpus Christi, Tex., LB $247,447, est. $180,000. wid'n base and asphaltic paving 11.769 mi. Hy. U. S. 181 Proj. C 101-1 and 2-11 and 13, Bee Co.;

D. H. Buchanan, 1318 N. 5 St., Temple, Tex., LB $93,212, est. $75,000. clearing, grubbing, fencing and appurtenances 37.61 mi. Hy. US 83, Proj. C 38-6, 504-9, 8 and 16, Starr and Zapata Counties;

Gulf Bitulithic Co., Box 2572, Houston 1, Tex., LB $95,231, frontage road, sidewalks and drives 0.294 mi. Hy. U. S. 90 and 290, Proj. C 50-9-10, Harris Co.;

Ned B. Hoffman, 617 Fort Worth Club Bldg., Fort Worth 2, Tex., LB $91,425, surf. addnl. 22.439 mi. Hy. U. S. 80, Proj. C 3-8-22, Reeves and Ward Counties;

Killian-Keller Co., Box 1981, San Antonio, Tex., LB $85,041, flexible base, one course surf. tr. 3.723 mi. Hy SH 97, Proj. C 328-4-9, Atascosa Co.; LB $79,790, grading, structures base and surf. 9.236 mi. Hy. FM 1631, Proj. S 1689 (1), Gillespie Co.;

Thomas & Ratliff, Rogers, Tex., LB $77,965, grading, structures, base, surf. 12.279 mi. Hy. FM 1726, Proj. S 1712 (1), Goliad Co.;

E. W. Hable & Sons, Corsicana, Tex., LB $69,894, grading, structures, base, surf. 3.043 mi. Hy. FM 1122, Proj. S 1798, Hardin Co.;

John F. Buckner & Sons, Box 76, Cleburne, Tex., LB $67,722, grading, structures, base, surf. 5.577 mi. Hy. FM 1705, Proj. S 1532 (1), Johnson Co.;

Adams Brothers, Box 271, Kaufman, Tex., LB $75,097, grading, structures, base and surf. 5.693 mi. Hy. FM 1617, Proj. S 1635 (1), Henderson Co.;

cancelled bids to have been opened Feb. 20, wid'n, grading and structures 12.92 mi. Hy. U. S. 80, est. $180,000, Culberson Co. Bids Feb. 20. CD 1/31, 2/4, and 2/8.

▲ **Brown & Root, Inc.**, Box 3, Houston, Tex., LB $5,128,210. excess canal and discharge main; intake and raw water pumping station on Ship Channel opposite Champion Paper Co.; water treatment plant for San Jacinto River Reservoir;

James R. Stewart Constr. Co., Box 8065, Houston, Tex., LB $39,020, est. $96,100, water mains, various streets, HOUSTON, TEX. City, City Hall, 900 Brazos St., Houston, Tex. Bids Feb. 27. CD 1/28.

† **Amis Constr. Co.**, 1647 Exchange Ave., Oklahoma City, Okla., LB $707,321, est. $750,000. runway exten. at Shepherd Field, ENG 34-066-52-31, WICHITA FALLS, TEX. U. S. Eng., Box 61, Tulsa 2, Okla. Bids Feb. 19. CD 1/29.

† **Western Paving Constr. Co.**, 5105 Washington St., Denver Colo., CA, $744,237, Schedules 1 and 2, aprons, taxiways and maintenance docks Lowry Air Force Base, DENVER, COLO. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Feb. 15, awarded Feb. 25. CD 2/25, under LB.

† **N. G. Petry Constr. Co.**, 1114 W. 7th Ave., Denver, Colo., LB $745,140, four 2-story wood frame, L-shaped, 80x34x234 ft., bachelor officers quarters and facilities at Lowry Airforce Base, Inc. 25-066-52-44, DENVER, COLO. U. S. Eng., 1709 Jackson St., Omaha, Neb., Bids Feb. 19. CD 1/16.

BUILDINGS

LOW BIDS AND CONTRACTS

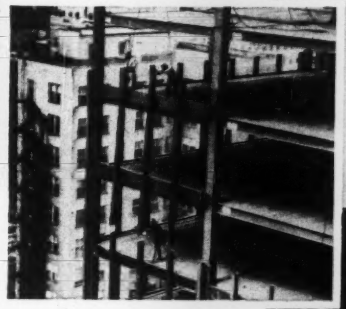
D'Arcy Leck Constr. Co., 2838 Stevens Ave., Minneapolis, Minn. LB $998,000. HIGH SCHOOL, FERGUS FALLS, MINN. Bd. Educ., Independent School Dist., 21, A. A. Vollbrecht, clk., Fergus Falls, Minn. Bids Feb. 27. CD 1/30.

▲ **John V. Walker**, 727 E. 67 St., Kansas City, Mo. CA $1,500,000. 175 HOUSES on 70 acre tract, sewers, etc., KANSAS CITY, MO. Boone Manor Addition, 89 and Wornall Rd., Kansas City, Mo.

Blue Ribbon Apartments, Inc., Lawton, Okla. Owner Builds. $670,229. nine 8 unit APARTMENTS, LAWTON, OKLA. Chas. Young, Lawton, Okla., archt.

(Continued on page 114)

THE DRAMATIC UPSWEEP of glass and steel that distinguishes Chicago's latest skyscraper apartment building was made possible by the unique steel design and construction that holds the floor-to-ceiling glass walls in place. The steel face of the building consists of horizontal facia plates welded across the spandrel beams, with vertical I-beam mullions on 5-foot, 3-inch spacings running the height of the building.



3,600-Ton Steel Framework for Chicago's Unique Glass House

Owner: 860 Lake Shore Drive Trust.
Architects and Engineers: Mies Van Der Rohe, Pace Associates, and Holsman, Holsman, Klekamp & Taylor, Chicago.

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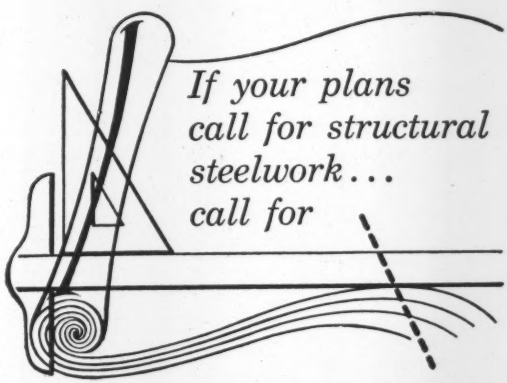

TWO 26-story towers of steel and glass connected at basement and ground floor comprise this ultra-modern 288-apartment structure. The unique design and construction of the vertical mullions and horizontal facia plates made possible the framing that holds the glass walls in place. There are no conventional masonry curtain walls. This imposing building occupies a block-long site along Lake Shore Drive and provides a beautiful view overlooking Lake Michigan on Chicago's swanky North Side within a short drive of the Loop. The 2,842 tons of structural steel and the 856 tons of plate steel for the face of the building were fabricated and erected by American Bridge.

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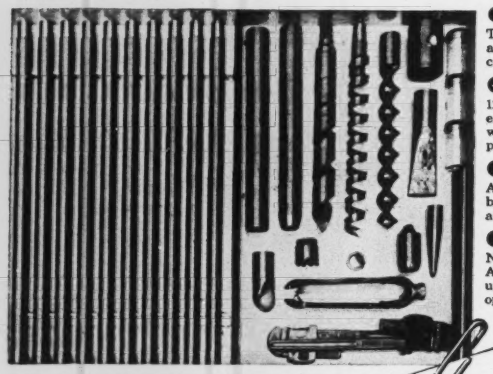

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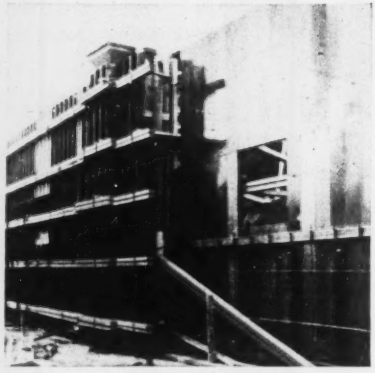

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(Continued from page 112)

▲ **E. M. Lambert & Sons,** Box 425, Abilene, Tex., LB $1,155,942, 150 DWELLING units, BORGER, TEX. Borger Housing Auth., Borger, Tex. Bids Feb. 27. CD 1/31.

▲ **J. J. Fritch,** 6834 Harry Hines Blvd., Dallas, Tex., LB $2,988,000. West Dallas HOUSING, Proj. Tex. 9-11-A, 84 bldgs. for total 544 housing units, DALLAS, TEX. Dallas Housing Auth., 2525 Lucas Dr., Dallas, Tex. Bids Feb. 25. CD 2/4.

▲† **J. W. Bateson Co. Inc.,** Irwin-Keasler Bldg., Dallas, Tex., CA, $7,079,000, addnl. BUILDING and utilities Spec. No. 5140, DALLAS, TEX. Veterans Admin., Munitions Bldg., Wash., D. C. Bids Feb. 12. CD 2/14, under LB.

▲† **T. C. Bateson Constr. Co.,** 618 Irwin-Keasler Bldg., Dallas, Tex., CA. $2,128,965, 2 WAREHOUSES for Fort Worth Quartermaster Depot, Inv. No. ENG 41-443-52-17, FORT WORTH, TEX., U. S. Eng., 1127 Texas & Pacific Bldg., Fort Worth, Tex. Bids Feb. 5, awarded Feb. 28. CD 2/12, under LB.

▲ **Brunson-White Associates,** 1600 Plantation Rd., Dallas, Tex., CA. $2,159,706, est. $2,250,000. Tex 4-3, 310 HOUSING units for total 62 bldgs. for Negroes, FORT WORTH, TEX. Public Housing Auth., City Hall, Fort Worth, Tex. Bids Feb. 12. CD 2/15, under LB.

Dow Chemical Co., Freeport, Tex., Own Forces. Approx. $112,000. Chlorine PLANT unit alterations, FREEPORT, TEX.

Manhattan Constr. Co., Commerce Bldg., Houston, Tex., CA, $500,000, AUTO SHOP, SERVICE and SALES, HOUSTON, TEX. Smith Chevrolet Co., 2300 Main St., Houston, Tex. Irvine & Hoyt, 5519 Memorial Dr., Houston, Tex., archts. CD 2/26.

C. E. Leslie, Kingsville, Tex., Owner Builds. Approx. $525,000. 70 rental HOUSING units, KINGSVILLE, TEX. Wade, Gibson & Martin, 419 Prof. Bldg., Corpus Christi, Tex., archts. CD 2/26.

▲ **W. G. McMillan,** Box 1447, Lubbock, Tex., CA. Approx. $1,200,000. CHURCH, LUBBOCK, TEX. First Methodist Church, Lubbock, Tex. Bids Sept. 25. CD 10/2, under LB.

▲**Leslie F. Crockett Constr. Co.,** 112 Academy Dr., Austin, Tex., LB $1,039,200. Tex. 10-3, 17 bldgs. for total 150 DWELLING units, WACO, TEX. Waco Housing Auth., Waco, Tex. Bids Feb. 29. CD 2/6.

† **Riedesel-Lowe,** Box 914, Cheyenne, Wyo., CA, $575,587. GENERAL SHOP BUILDING 34, WAREHOUSE BUILDING No. 51 at Rocky Flats INV. No. 292-52-29, BOULDER, COLO. U. S. Atomic Energy Comn., Box 5400, Albuquerque, N. M. Bids Feb. 11, awarded Feb. 25. CD 2/20, under LB.

▲ **Newstrom-Davis & Co.,** 2000 W. 8 Ave., Denver, Colo., CA $1,933,777, Westwood Site HOUSING, Project Colo. 1-11, incl. 260 units, 32 two-story brick bldgs., DENVER, COLO. Denver Housing Auth., 1449 Navajo St., Denver, Colo. Bids Feb. 20, awarded Feb. 25. CD 3/3, under LB.

▲ **Thomas Bate & Sons,** 2311 10 St., Denver, Colo., LB, $3,233,355, Curtis Park Site HOUSING, Project Colo. 1-9, incl. 450 units, 2 story, brick 74 bldgs. DENVER, COLO. Denver Housing Auth., 1449 Navajo St., Denver, Colo. Bids Feb. 25. CD 1/23.

Pew Constr. Co., Missoula, Mont. LB $519,057, general contract men's DORMITORY, Montana State University, MISSOULA, MONT. State Bd. Examiners, Helena, Mont. Bids Feb. 14. CD 1/30.

FAR WEST

BIDS ASKED—BUILDINGS

▲ Wash., Seattle—DORMITORY—B.A. 4/1—University of Washington, Seattle, Zone 5, 10 story, bsmnt., rein.-con. men's dormitory. $2,500,000. Plans deposit $25. Young & Richardson, Carleton & Detlie, Central Bldg., Zone 4, archts. CD 8/3/50.

SOON LETS CONTRACT—BUILDINGS

▲ Wash., Whidbey Island—HOUSING—Pub. Wks. Officer, Thirteenth Naval Dist., 1611 W. Wheeler St., Seattle soon lets contract 300 housing units under Wherry Act. $2,700,000. R. L. Durham & Assocs., 2100 Denny Way, Seattle, archts. CD 2/14.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† Intermountain Plumbing Co. and Henry L. Horn, Connell, Wash., CA, $852,815, constr. Lower and Upper Saddle Gap and PE-17 pumping plants, lateral PE-16.4 pipe siphon in Area P-1 and laterals in Area P-13, Columbia Basin Proj., Spec. DC 3613, WASHINGTON Bureau Reclamation, Dpt. Interior, Ephrata, Wash. Bids Feb. 5, awarded Feb. 15. CD 2/14, under LB.

WASHINGTON—State Hy. Dpt., Olympia.

K. F. Jacobson & Co., Inc., 0445 S.W. Porter St., Portland, Ore., CA, $636,216, c. conc. and b. conc. 4.776 mi. Hy. 1, Castle Rock to Toutle River, F.A.P. No. FI 001-1 (7) Cowlitz Co. Bids Feb. 26. CD 2/12.

WASHINGTON—State Hy. Dpt., Olympia.

Curtis Gravel Co. and D-H Paving Co., P.O. Box 106, Spokane, Wash., CA, $847,435, est. $905,000, b. conc. surf. and paving 7.03 mi. Hy. 3, Richland Junction to Kennewick F.A.P.F 018 4 (3), Benton Co. Bids Feb. 19. CD 2/28, under LB.

R. L. Moss Co., Zenith, Wash. LB, $610,720, 33x55 ft., primary sewage disposal plant and 10,000 ft. 8- to 12-in. cement asbestos vitr. clay and c. i. sewers at Lakeland Village, MEDICAL LAKE, WASH. State Dpt. P. Institutions, Olympia, Wash. Bids Feb. 21. CD 2/6.

† **G. J. Bouten Constr. Co.,** N216 Division St., Spokane, Wash. LB, $594,800, est. $620,128, 200x500 ft., frame WAREHOUSE at Fairchild Air Force Base, Inv. 52-19, SPOKANE, WASH. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Feb. 27. CD 1/22.

† CALIFORNIA—Bureau P. Rds., Dpt. Commerce, 1101 Flood Bldg., San Francisco.

Natt McDougall Co., Pittock Block, Portland, Ore., LB,

$515,620, clearing, grading, fence, etc. 7.051 mi. Klamath River, Klamath National Forest, Siskiyou Co. Bids Feb. 19. CD 2/7.

† **Nicholson, Ferry & Van Valkenberg,** 880 E. Colorado St., Pasadena, Calif., CA. $629,000. facilities for aircraft ranges at N.O.T.S., Spec. 32907, INYOKERN, CALIF. Dpt. Navy, Naval Ordnance Test Station, China Lake, Calif. Bids Feb. 21. CD 2/5.

† **Peter Kiewit Sons Co.,** 345 Kieways Ave., Arcadia, Calif., LB $620,000. strengthen taxiway and parking aprons at Brown Field, Spec. 30873, SAN DIEGO, CALIF. Dpt. Navy, San Diego, Calif. Bids Feb. 21. CD 2/8.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† **MacDonald-Woodworth-Wright,** 1517 S. Tacoma Way, Tacoma, Wash., LB, $9,368,994, est. $9,133,804, 40 BARRACKS bldgs. in permanent troop facilities area, Inv. 52-130, FORT LEWIS, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Feb. 28.

Ostruske-Murphy Co., 2907 A St., Tacoma, Wash., CA, $595,500, High SCHOOL, TACOMA, WASH. Franklin Pierce School Dist. 402, Tacoma, Wash. Lea, Pearson & Richards, Tacoma Bldg., Tacoma, Wash., archts.

▲ **Bellflower Gardens,** 6338 Wilshire Blvd., Los Angeles, Calif. Owner Builds. Approx. $1,699,700, 182 stucco DWELLINGS, Faywood, Mapledale, Fairton and Nichols Sts., BELLFLOWER, CALIF. C. E. DuBois, 2342½ Beverly Glen Blvd., Los Angeles, Calif., archt.

▲ **Show Contr. Co.,** 8634 E. Firestone Blvd., Los Angeles, Calif., CA, Approx. $2,270,000. 225 stucco DWELLINGS, Gridley Rd., Harvest Ave., Longworth Ave., DOWNEY, CALIF. Cinco, Inc., 8634 E. Firestone Blvd., Los Angeles, Calif.

Allison Honer Co., 312 N. Main St., Santa Ana, Calif., CA, $784,878, high SCHOOL at Shaffer and Walnut Sts., ORANGE, CALIF. Orange City School Dist., 370 N. Glassel St., Orange, Calif. Bids Feb. 19. CD 2/29, under LB.

Rothschild, Raffin & Weirick, 274 Brannon St., San Francisco, Calif., CA, $631,300, general contract Lakeside Elementary SCHOOL, SAN FRANCISCO, CALIF. Dpt. P. Wks., City Hall, San Francisco, Calif. Bids Feb. 13, awarded Feb. 21. CD 2/20, under LB.

E. Philip Merritt, Inc., P.O. Box 414, San Rafael, Calif., CA, $614,000, 100 HOUSING Units, CAL 45-1, SAN PABLO, CALIF. City of San Pablo Housing Auth., P.O. Box 118, San Pablo, Calif. Bids Feb. 5, awarded Feb. 26. CD 2/12, under LB.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ † **Carson Constr. Co.,** Box 1153, Helena, Mont., LB $1,625,000. terminal bldg. at Anchorage Airport;

Pacific Constr. Co., Vancouver, Wash., LB $800,000. terminal bldg. at Fairbanks Airport, ALASKA. Civil Aeronautics Admin., Anchorage, Bids Feb. 18. CD 2/11.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† **S. S. Mullen, Inc. and B. Chandler,** 621 9 Ave. N., Seattle, Wash., LB $1,746,604, 150 unit HOUSING in 2 story frame bldgs. with central steam heating plant, ALAS 1-3, ANCHORAGE, ALASKA. Alaska Housing Auth., c/o Miller & Ahlson, archts., 1410 Hubble Pl., Seattle, Wash. Bids Feb. 29. CD 2/4.

▲ **Anchor Homes, Inc.,** c/o Waale-Camplan Co., 2100 S. W. Jefferson St., Portland, Ore., Day Labor. $3,495,100. 252 HOUSES in Goose Lake area, ANCHORAGE, ALASKA. A. Southwell, Oswego, Ore.. archt. CD 2/25.

† **Patti-MacDonald Constr. Co.,** Anchorage, Alaska, CA $744,252, 2 story 23x64 ft. and 50x70 ft., rein. con. SCHOOL, ELMENDORF AIR FORCE BASE, ALASKA. U. S. Housing & Home Finance Agency, New World Life Bldg., Seattle, 4, Wash. Bids Feb. 20. CD 2/28, under LB.

† **Patti-MacDonald Constr. Co.,** Anchorage, Alaska, CA $981,673, 2 story, 64x336 ft., and 50x70 ft. rein.-con. SCHOOL, FORT RICHARDSON, ALASKA. U. S. Housing & Home Finance Agency, New World Life Bldg., Seattle, 4, Wash. Bids Feb. 20. CD 2/28, under LB.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

Ont., Cooksville—B.A. 3/17—Toronto Twp., J. H. Pinchin, clk., Municipal Bldg., water purification plant, high and low lift pumping station, 1 m.g. reservoir. $450,000. Plans deposit $50. Gore & Storrie, 1130 Bay St., Toronto, engrs. CD 3/13/51.

BIDS ASKED—BUILDINGS

B. C., Essondale—LAUNDRY, etc.—B.A. 3/26—Minister of P. Wks., Parliament Bldg. Victoria, 4 story, rein.-con. laundry and stores bldg., $500,000. C. Campbell, Douglas Bldg., Victoria, archt. CD 11/21/50.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Kenney Constr. Co. Ltd., 396 Main St., Yarmouth, N. S., Ca, Approx. $500,000, central heating plant (high pressure bituminous coal) at R.C.A.F. Station GREENWOOD, N. S. Defence Constr. Ltd., 1032 Gottingen

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Philip D. Barnard, 2038 Addison, Houston 5, Tex.
Western Steel Prod. Co., 1758 W. 10th Ave., Denver 4, Colo.

St., Halifax, N. S., P. J. Mangan, c/o owner, engr. Bids Dec. 28. CD 12/11.

H. J. McFarland Constr. Ltd., Talbot St., Picton, Ont., CA, $819,928, constr. and install facilities at R.C.A.F. Station, PICTON, ONT. Defence Constr. Ltd., 441 Queen's Quay W., Toronto, 2B, Ont. R. P. Opie, c/o owner, ch. engr.

A. W. Robertson Ltd., 57 Bloor St. W., Toronto, Ont., CA, $539,750, standard central heating plant;

George Hardy Ltd, 163 Wicksteed Ave., Toronto (Leaside) Ont., CA, $501,878, central heating plant at R.C.A.F. Station, TORONTO, ONT. Defence Constr. Ltd., 441 Queen's Quay W., Toronto, Ont. R. P. Opie, c/o owner, engr.

BUILDINGS

LOW BIDS AND CONTRACTS

Bennett & White Calgary Ltd., 1120 Ninth Ave. W., Calgary, Alta., CA, $532,373, SHOP bldgs. at education center, CALGARY, ALTA. Dpt. P. Wks., Parliament Bldgs., Edmonton, Alta. Awarded Feb. 23.

▲ Terminal Constr., Co. Ltd., Dominion Bldg., Montreal, Que. and Newfoundland Engineering & Constr. Co. Ltd., Box 578, St. John's Newfoundland, CA, $4,000,000. first stage paper MILL EXPANSION, digesters, etc. CORNER BROOK, NEWFOUNDLAND. Bowater's Newfoundland Pulp & Paper Mills Ltd., Corner Brook, Newfoundland. Awarded Feb. 22. CD 12/14.

FOREIGN

BIDS ASKED—HEAVY CONSTRUCTION

New Zealand—B.A. 6/24—Secy. Tenders Bd., Ministry of Wks., Box 8015, Govt. Buildings, Wellington, to engage civil engineering contracting firm to complete construction of the Roxburgh Proj., incl. completing construction of dam, spillway, power house and associated works, Roxburgh Hydro-Electric Power Project; adv. ENR 3/13. CD 10/4, under Americans Abroad.

Proposed Projects

WATER SUPPLY

Ga., Gainesville—City, relocating water treatment plant, due to construction of Buford Dam, Approx. $100,000. Robert & Co. Assocs., 96 Poplar St N. E., Atlanta, consult. engrs. CD 4/28/47.

Ill., Gilman—City, replacing water treatment works, increase water supply, $100,000. Warren & Van Praag, 253 S. Park St., Decatur, consult. engrs.

▲ Mich., Detroit—City, Water Dept., brick, steel, concrete filtration plant, $3,700,000, Ayres, Lewis, Norris & May, 506 Wolverine Bldg., Ann Arbor, consult. engrs. CD 11/11/48.

Mich., Flint—City, Harold M. Kinder, mgr., rein.-con. filtration plant, Stewart Ave., $250,000, Ayers Lewis Norris & May, 506 Wolverine Bldg., Ann Arbor, consult. engrs. CD 11/27/50.

Mont., Glasgow—City, water sys. imprvs., incl. 2 gravel packed wells, 2 deep well turbines, 1 standby gas motor, 9,900 ft. water pipe, 1 m.g. concrete or steel reservoir, R. C. Fargo, city engr.

N. C., Longview—Town, voted $150,000 bonds, WW imprvs. CD 2/6.

N. C., North Wilkesboro—City, voted bonds, WW imprvs. $808,000. CD 1/25.

Tex., Edna—City, City Hall, Proj. 1, water supply sys., $150,000; Proj. 2, water main, distr. lines, $100,000. Glenn Enbrock, c/o General Delivery, Houston, consult. engr.

▲ Tex., Haltom City—City, c/o J. C. Gunter, mayor, 3101 Haltom Rd., voted bonds, complete new water sys. $1,900,000.

Tex., Longview—City, City Hall, water treatment plant addn. $90,000; water mains, supply, $160,000. Homer A. Hunter, 3708 Abrams Rd., Dallas, consult. engr.

Tex., Pasadena—City, City Hall, new water lines into recently developed areas, $250,000; water sys. rehabilitation, $90,000. George S. Smith, city engr.

Tex., San Antonio—Fred W. Davis, 1210 Main St., Dallas, water lines, in Jackson Terrace, $37,000 near here. J. W. Beretta, Engineers, Travis Bldg., consult. engrs.

▲ Va., South Boston—City, bond election April 1, WW and sanitary sewer imprvs., $1,000,000. CD 11/8.

SEWERS, WASTE DISPOSAL

Calif., Fullerton and Brea—Cities of Fullerton and Brea trunk sewer line from Brea through Fullerton to an outfall sewer. $317,520.

Ill., Mount Vernon—City, City Hall, sewage disposal plant, auxiliaries and appurtenances sewer extensions, etc. $750,000. Consoer, Townsend & Assocs., 351 E. Ohio St., Chicago, Zone 11, consult. engrs. K. H. Letzkus, City Hall, city engr. CD 1/29.

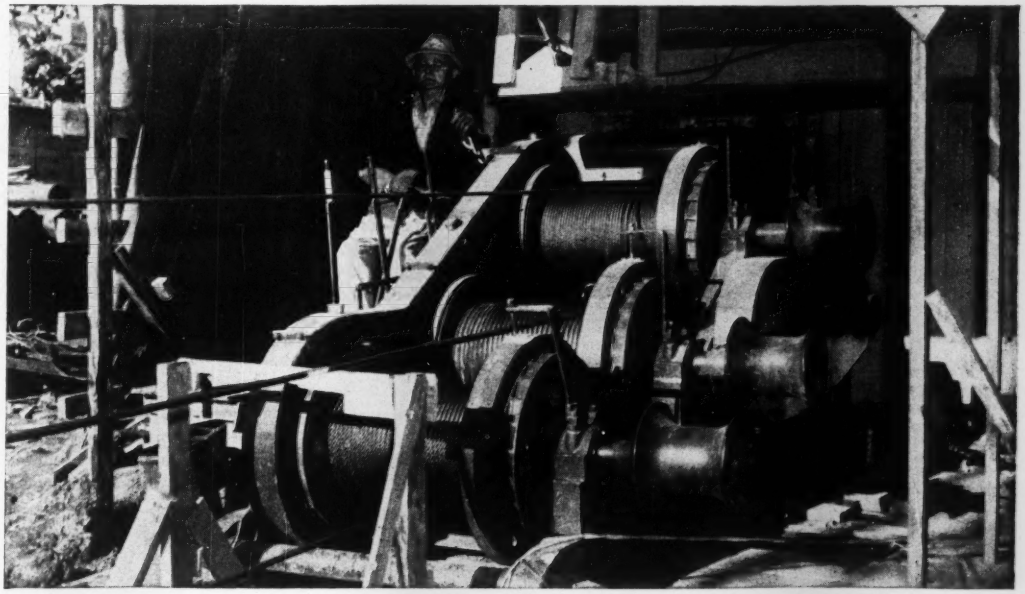
Ind., Franklin—City, sewage treatment plant, sanitary sewers $725,000. Paul Kleiser & Assocs., 671 Tippecanoe St., Terre Haute, consult. engrs.

Mass., Fall River—City, Dpt. P. Wks., City Hall, incinerator. Approx. $300,000.

Mass., West Springfield—Town, Bd. Selectmen, 126 Park St., intercepting sewers, pumping station, $850,000. Tighe & Bond, 189 High St., Holyoke, consult engrs. CD 8/27.

(Continued on page 118)

"Nothing can touch them!"



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(Continued from page 116)

Mich., St. Louis—City, Dpt. P. Wks., sewage disposal treatment facilities, $350,000. CD 6/6/47.

N. C., North Wilkesboro—City, voted bonds, sanitary sewer imprvs. $442,000. CD 1/28.

O., Columbus—City, Elmer Keller, service dir., storm sewer to serve East Side on E 13 Ave. to tie into storm sewer line at James Rd. and Ruhl Ave., $225,000, Orris Bonney, div. sewerage engr. CD 2/11.

▲ S. C., Charleston—City, City Hall, sewage disposal plant, $5,000,000. G. M. Howe, city engr. CD 8/11/44.

Tex., Channelview—Jack Jones & Assocs., 3008 Caroline St., Houston, sanitary sewers, $80,000; storm sewers, $75,000 725 home site residential subdivision on Houston-Baytown Rd., near here.

Tex., Harlingen—Owners, c/o Reuben Herren, Harlingen, sanitary sewers, $60,000; storm sewers, $62,500.

Tex., Houston—City, City Hall, 900 Brazos St., laying outfall sewer sections, Crane, Collingsworth, Brewster and Legion Sts. $111,000. Frank Baldwin, Dir. P. Wks. CD 5/24/49.

Tex., Houston—Lyons Garden Apartments, 2300 Block Lyons Ave., Houston, sanitary sewers, $63,500; storm sewers, $60,000 off Lyons Ave. R. C. Shaner, 4019 River Dr., Houston, consult. engrs.

Tex., Longview—City, City Hall, sewage treatment plant, $75,000; some addnl. sanitary sewer collection mains, lift station, $175,000. Homer A. Hunter, 3708 Abrams. Rd., Dallas, consult. engr.

Tex., Pasadena—City, City Hall, sanitary sewer line extend. into recently developed areas, $451,000; sanitary sewerage sys. rehabilitation, $125,000; sewage disposal plant, $100,000. George S. Smith, city engr. CD 9/22/48.

Tex., San Antonio—Fred W. Davis, 1210 Main St., Dallas, sanitary sewers, $70,000; storm sewers, $65,000, in an extension of Jackson Terrace, 84-acre site, near here. J. W. Beretta Engineers, Travis Bldg., consult. engrs.

BRIDGES

Okla., Tulsa—Tulsa Co., underpass at Memorial Rd. and Frisco tracks, $100,000, Geo. Straugher, Court House, engr.

Tex., Dallas—Dallas County Road Dist. 1, Court House, concrete type vehicle bridge across Duck Creek, on Centerville Rd, $125,000. Koch & Fowler, 3900 Lemmon St., consult. engrs. CD 9/13/49.

Tex., Progreso—B. & P. Bridge Committee of Weslaco and Mercedes, c/o J. T. Ellis, Jr., Weslaco, constr. an International Bridge across Rio Grande River near here, $280,000. R. Newell Waters, Weslaco, consult. engr.

STREETS AND ROADS

GEORGIA—State Hy. Dpt., Atlanta,
Bibb Co.—paving 1½ mi. Hillcrest Ave. in city of Macon, $104,000.

Ky., Louisville—Jefferson Co. Comn., widen from 2 to 4 lanes, distance 2½ mi. Newburg Rd. from city limits to Old Shepherdsville Rd., near here, approx. $250,000.

▲ Mich., Jackson—Jackson Road Comn., Court House, 18 mi., blacktopping, 6 mi., recapping, 45 mi. seal coating, 29 mi. grade wid'n., drainage and grav. county roads, $1,000,000 or more. CD 10/23/44.

† MONTANA—U. S. Forest Service, Federal Bldg., Missoula,
Cascade Co.—surf., plant-mix oil 8 mi. Hy. 89 south of Riceville between Great Falls and Neihart, $275,000.
Flathead Co.—grading, bridging 5.5 mi. Swan Lake-Seeley Lake Rd., $250,000.
Gallatin Co.—surf., plant-mix oil 13.2 mi. Hy. 191 between Bozeman and West Yellowstone, $300,000.
Glacier Co.—surf., plant-mix oil 8.11 mi. Hy. 2 between East Glacier and West Glacier, $250,000.
Lincoln Co.—grading 2.6 mi. Hy. 2 between Troy and Idaho line, $100,000.
Mineral Co.—grade 6.8 mi. Hy. 10 between Saltese and St. Regis, $350,000.

OHIO—State Hy. Dpt., T. J. Kauer, dir., Columbus,
Medina Co.—widen W. Liberty St. to three-lane road, repave this portion of Rte. 18, $250,000. CD 2/23/45.

Tex., Channelview—Jack Jones & Assocs., c/o Mainland Mortgage Co., 3008 Caroline St., Houston, street construction and paving, some concrete curbs and gutters, 725 home site residential subdivision, on Houston-Baytown Rd., near here, $120,000.

Tex., San Antonio—Fred W. Davis, 1210 Main St., street constr. and hard paving in an extension of Jackson Terrace, 84-acre tract, $77,500, near here. J. W. Beretta Engineers, Travis Bldg., consult. engrs.

Ont., Sarnia—City Council, road work, incl. paving S. Vidal St. and addnl. work on bridges and culverts, $626,813. Wm. Greenwood, City Hall, city engr.

▲ Ont., Toronto—City, A. A. Lamport, mayor, City Hall, expansion express highway west from Bathurst St., second bridge over Humber River at Queen Elizabeth Highway and Lakeshore Blvd. $20,000,000. L. B. Allan, comr. works.

EARTHWORK, WATERWAYS

South Carolina—State Hy. Dpt., Columbia, erosion control on beaches, $200,000.

AIRPORTS

▲ N. Y., Idlewild—TAXIWAY, etc.—Port of New York Auth., 111 8 Ave. New York, 11, N. Y., taxiway at New York International Airport, $500,000; 40x1,000 ft. prefabricated steel cargo bldg. at New York International Airport, $700,000. CD 4/27/44.

Tex., LaPorte—ADMINISTRATION BLDG., etc.,—City, City Hall, administration bldg., $250,000; hangar, $150,000; runway grading and paving $100,000.

Wash., Seattle—RUNWAY—King Co., County-City Bldg., Zone 4, replacing 2,400 ft. runway at Boeing Field, $350,000. D. L. Evans, co. engr.

PUBLIC BUILDINGS

▲ Calif., Arcadia—SCHOOL FACILITIES—Arcadia School Dist., Arcadia, voted $1,500,000, bonds Feb. 18, school facilities expansion.

▲ Calif., Downey—HOSPITAL—Bd. Suprvrs. Los Angeles Co., Hall of Records, Los Angeles, plans by Adrian Wilson & Paul R. Williams, 3757 Wilshire Blvd., Los Angeles, Type 1, construction 70,000 sq. ft. post polio hospital at Ranchos Los Amigos, $1,103,000.

Calif., Escondido — SCHOOL—Escondido Union High School Dist., Escondido, $970,000 bond election Apr. 22, high school.

▲ Calif., Inglewood—SCHOOL FACILITIES—Inglewood Elementary School Dist., 111 N. Grevilla St., $2,750,000 bond election Apr. 24, school facilities. CD 1/30/51.

Colo., Boulder—SCHOOL—School Dist. 5, Fairview Consolidated, Boulder, 1 story, Grade and Junior High School, $494,000. Atchison & Kloverstrom, 1254 Monaco Parkway, Denver, consult. engrs. and archts.

▲ Conn., Stonington—SCHOOL—Town, Bd. of Edu., plans by Chas A. Maguire & Assoc., 1015 Turks Head Bldg. Providence, R. I., 2 story, brick, steel, concrete high school, $1,600,000. CD 10/2.

▲ Del., Wilmington—WAREHOUSE, etc.—City, Bd. Harbor Comrs., foot of Christian Ave., warehouse and transit shed, $1,250,000. Harris Dechant & Assocs., Fidelity-Phila. Trust Bldg., Phila., Pa., consult. engrs. and archts.

Ga., Augusta—SCHOOL—Richmond Co. Bd. Edu., 422 7 St., plans by Scroggs & Ewing, Greene St., Wheless Rd. School, $520,000. CD 6/22.

▲ Ill., East St. Louis—HIGH SCHOOL—Bd. Educ., School Dist. 189 of St. Clair Co., Bd. Educ. Bldg., 240 N. 6 St., plans by Albert M. Goedde, 1452 State St., brick, rein.-con steel high school, on 30½ acre site, 51 and State Sts., $3,000,000. CD 4/20.

Ind., Portland—SCHOOL—Portland-Wayne Twp. Bldg. Corp., Portland, plans by McGuire & Shook, 1400-01 Fletcher Trust Bldg., Indianapolis, Zone 4, 1 story, bsmnt., 171x292 ft. brick, stone Judge Haynes School, Walnut and High Sts. $400,000. Jno. M. Rotz Eng. Co., 80 Merchant Bank Bldg., Indianapolis, Zone 4, mech engr.

▲ Kan., Coffeyville—SCHOOL—Bd. Educ., voted $1,750,000 bonds Feb. 19, schools. CD 1/2.

▲ Kan., Sunflower — HOUSING — Sunflower Ordnance Works, c/o Col Don M. Hoffman, DeSoto, 500 housing units, Sunflower Village, $3,500,000.

▲ Ky., Henderson—SCHOOL—City plans by Meriwether, Marye & Assoc., 236 E. Short St., Lexington, high school, $1,000,000.

▲† Md., Annapolis—UTILITY IMPRVS.—Dpt. Navy, Pub. Wks. Officer, U. S. Naval Academy, plans by Whitman, Requardt & Assoc., engrs. and archts., 1304 St. Paul St., Baltimore, major utility imprvs., steam, electric and fresh water, $2,685,000. CD 11/17/47.

▲ Md., Towson—SCHOOLS—Baltimore Co. Bd. Educ., Aigburth Rd., plans by Henry Powell Hopkins, 10 E. Mulberry St., Baltimore, brick, concrete block, steel Maidens Choice Elementary School addn., $530,000; plans by Gaudreau & Gaudreau, 330 N. Charles St., Baltimore, stone, cinder block, steel Sollers Point Junior & Senior High School addn. (colored), $400,000; plans by Taylor & Fisher, 1012 N. Calvert St., Baltimore, stone, brick, concrete steel, cinder block Towson High School addn., $300,000, Egli & Gompf, Inc., 1019 N. Calvert St., Baltimore, mech engrs. Morris R. Baker, Aigburth Manor, Towson, engr. CD 5/5/49.

Mass., Fitchburg—DORMITORY—State, Dpt. Educ., 200 Newbury St., Boston, plans by Chester Browne & Assoc., 184 Boylston St., Boston, Contr. 7713-04, dormitory, State Teachers College, $700,000.

▲ Mass., Lawrence—SCHOOL—City, City Hall, plans by Perley F. Gilbert & Assoc., Inc., 53 Central St., Lowell, Alexander B. Bruce Elementary School, on site bounded by Providence, Milton and Butler Sts. $2,000,000. CD 8/6/51.

Mass., Lawrence—EXPERIMENT STATION—State, Dpt. P. Health, State House, plans by Tighe & Bond, 189 High St., Holyoke, H-401 experiment station, $402,000.

Mass., Newton—SCHOOL—City, Bldg. Comm. Office, City Hall, Newton Center, plans by Andrews Jones Biscoe & Goodell, 50 Congress St., Boston, Spaulding School, Oak Hill Village, $300,000.

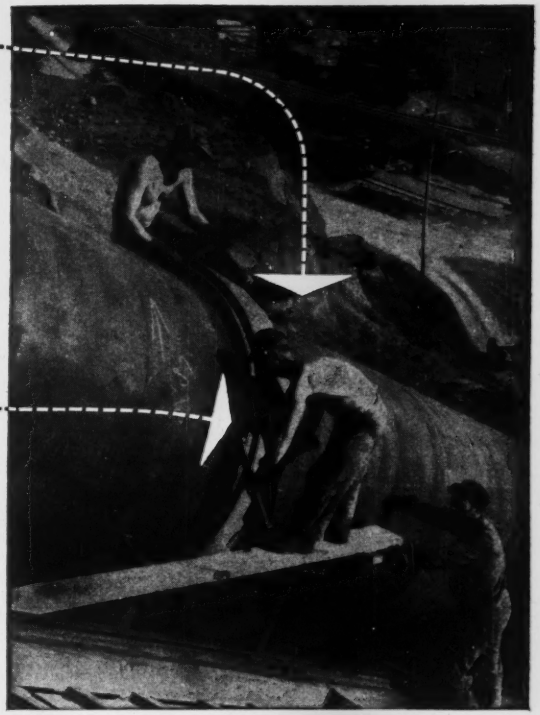
Mass., Pittsfield—INFIRMARY—City, Dpt. P. Welfare, plans by Hampton & Fisher, 30 Backman Ave., 1 and 2 story, 170x190 ft. brick, concrete infirmary, $650,000.

▲ Mich., Adrian—SCHOOL—Bd. Educ., $2,800,000. bond election Apr. 8, school in northwest and southern

(Continued on page 120)

from penstocks to water mains . . .

Dresser Couplings absorb pipe movement, prevent built-up stresses, speed construction

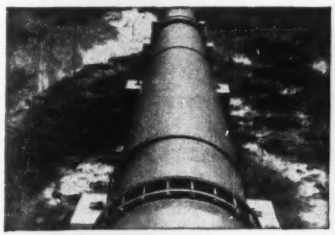


On either exposed or buried lines, from 3/8" to 72" diameter or larger, your best protection against vibration or movement stresses is a Dresser Coupling. Each of these "flexible-tight" joints takes up to 3/8" expansion-contraction movement . . . up to 4° deflection . . . cushions your line at every joint. Specially compounded rubber gaskets soak up vibration like a sponge.

Installation of Dresser Couplings is simplicity itself. Any workman can install them; the only tool needed is a wrench. And fast? On a typical 48" water line, 40 lengths of pipe were laid in one 8-hour day using a two-man joining crew.

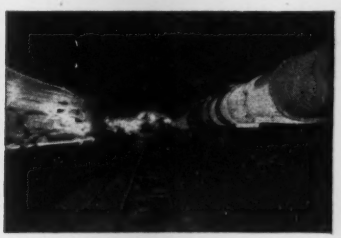
Performance on half a million miles of pipe proves Dresser dependability.

75" penstock of the British Columbia Electric Co. One of three installed at Bridge River, using Dresser Couplings specially designed for the job. With Dressers, construction time was cut from months to weeks, due to simplicity of installation. And penstocks have remained bottle-tight under very high pressures, despite severe weather conditions.



Over swamps and marshy ground, where earth movement must be considered, Dresser Couplings keep Savannah's, new 14-mile, 42" water supply artery completely tight.

In busy streets of Stoneham, Mass., simplicity and ease of installing Dresser Couplings gets the job finished sooner. Dressers absorb traffic vibrations.



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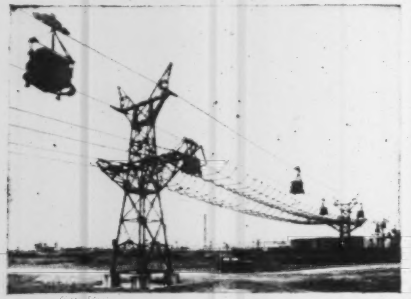

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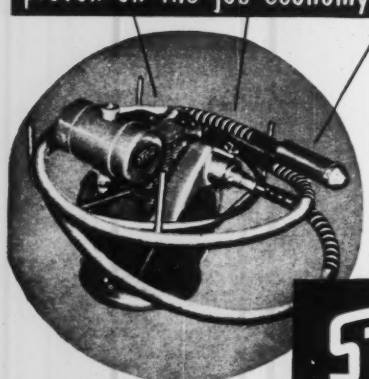

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(Continued from page 118)

sections, and 6 room McKinley School addn. CD 8/10/51.

Mich., Dearborn—SCHOOL—City, Bd. Educ., plans by Bennett & Straight, 15624 Michigan St., 2 story, brick, concrete William Nowlin Elementary School addn., Penn Ave. $400,000. CD 12/28/50.

Mich., Flint—FIELD HOUSE AND GYMNASIUM—Flint Junior College, J. Fred Totten, pres., Flint, plans by S. A. Nurmi, 712 W. Court St., 1 and 2 story, 115x135 ft., brick cinder blocks, glass field house and gymnasium, Oak Grove Campus, $600,000. CD 2/13/51.

▲ Neb., Lincoln—HIGH SCHOOL, etc.—Bd. Regents University of Nebraska, 12 and R Sts., Lincoln Teachers College High School, $1,000,000, CD 10/31/50, pharmacy bldg., $750,000; campus power plant expansion $500,000; laboratory addn., $400,000.

N. Y., Garden City—VILLAGE HALL—Village, plans by Moore & Hutchins, 215 E. 37 St., New York, Zone 16, village hall Stewart Ave. between Hilton and Franklin Sts. $500,000.

▲ N. C., Jacksonville—SCHOOL—Onslow Co. Bd. Educ., Jacksonville, bond election May 31, school imprvs. $1,100,000.

▲ N. C., New Bern—TRYONS PALACE—State Bd. Conservation & Development, State Capitol, Raleigh, plans by W. G. Perry, 31 St. James Ave., Boston, Mass., restoration Colonial Governor William Tryon Palace, $1,500,000. CD 9/20.

O., Mentor—SCHOOL—Bd. Educ., Mentor School Dist., $975,400 bond election Apr. 1, Mentor Shore Elementary School addn., remodel Center Street School, Mentor High School and Mentor Elementary School.

Okla., Oklahoma City—RECITAL HALL—Oklahoma City University, 2400 N. Blackwelder St., plans by Winkler & Reid, Kerr-Magee Bldg., recital hall, $400,000. CD 12/17/47.

Pa., New Kensington—HIGH SCHOOL—Allegheny Twp. School Dist., New Kensington, plans by Enos Cooke, 316 Charles St., 2 story brick, block, steel fr. Junior High School, Allegheny Twp. $450,000.

▲ S. C., Kershaw—HOSPITAL—Kershaw Co., Kershaw, hospital. $2,000,000.

Tex., Alice—HIGH SCHOOL—Alice Independent School Dist., Alice, plans by Addis E. Noonan Assoc., American Hospital & Life Bldg., San Antonio, 55,000 sq. ft. Junior High School $500,000. R. W. Barnes, 702 Ogden Lane, San Antonio, consult. engr. CD 9/10.

Tex., Dallas—SCHOOLS—Dallas Independent School Dist., Akard and Royal Sts., plans by Pettigrew-Worley & Co., 160 Avery St., and Mark Lemmon, (school consult.), 1210½ Main St., Dallas Northwest Harlee School, $450,000; plans by Tatum & Quade, 2812 Fairmount St., construct La Reunion School, $500,000. CD 10/6/49.

▲ Tex., Hillsboro—HOUSING—Hillsboro Housing Auth., Hillsboro, 150 low-cost housing units. $1,125,000.

▲ Tex., Houston—DORMITORY, etc.—Southern University for Negroes, 3200 Wheeler St., plans by Cato, Austin & Evans, 2103 Crawford St., 3 story dormitory for men, $500,000; 3 story dormitory for women, $550,000; dining hall, $400,000. CD 7/8/50.

▲ Va., Arlington—HIGH SCHOOL—Arlington Bd. Educ., 1426 N. Quincy St., plans by Rhees Burket, 1223 Connecticut Ave. N. W., Wash., D .C., construct Wakefield Junior-Senior High School. $4,000,000. CD 4/24/51.

Va., Richmond—SCHOOL—Bd. Educ., City Hall, George Mason school addns. $658,000.

▲ Wis., Madison—CITY HALL, etc.—City, City Hall, Madison and Dane Co., Court House, Madison, plans by Law, Law, Potter & Nystrom, 121 S. Pinckney St., 6 story city hall and courthouse, $8,000,000. CD 2/13/45.

COMMERCIAL BUILDINGS

Del., Wilmington—SCHOOL—St. Thomas Roman Catholic Church, 310 N. Bayard Blvd., plans by Gleeson & Mulrooney, Fox Bldg., Phila., Pa., school, $400,000.

▲ Ga., Savannah—HOUSING—U. S. Eng., Post Office Bldg., plans by C. W. Bergen, W. P. Bergen, Armistead & Saggus, Candler Bldg., Atlanta, construct, manage and finance, 500 Wherry Act Housing Units for Hunter Air Force Base, personnel, $4,000,000.

Ind., Indianapolis—APARTMENT—Leo A. Lippman, pres. L & L Bldg. Corp., 2268 N. Meridian St., plans by Paul I. Cripe, Lemcke Bldg., apartment, Saxony Apartments, incl. 69 apartments, 29 S. Audubon Rd., $651,000; Medfort Apartments, incl. 36 apartments, 3530 N. Pennsylvania St., $338,000.

▲ Ky., Louisville—HOUSING—Glenn D. Whitehurst, 1716 Marlow Rd., 80 homes, 6-4 unit apartments on Crum's Lane. $1,000,000.

Mass., Newburyport—HOSPITAL—Anna Jacques Hospital, Highland Ave., plans by James A. Ritchie & Assoc., 135 Clarendon St., Boston, 3 story, bsmnt., brick, steel, concrete hospital addn., alterations, Highland Ave. $500,000, Edwin P. Mahard, 473 Statler Bldg., Boston, elec. engr. Chas. L. Thompson, 385 Atlantic Ave., Boston, san. engr. CD 9/2/48.

▲ Mich., Gratiot—SHOPPING CENTER—J. L. Hudson, 1206 Woodward St., Detroit, plans by Victor D. Gruen, 1903 Industrial Bldg., Detroit, Eastland Shopping Center, incl. residential proj., main store Hudson Department Store, parking facilities, etc. on 300 acres, Eight Mile Rd. and Kelley Rd., $10,000,000. CD 10/30/50.

Mo., Independence—HOUSING—Emerson R. Moseley, 900 Home Ave., Independence, and F. F. Moseley, 1216 W. 66 St., Kansas City, Mo., Westport Plaza Subdivision, 47 homes, $500,000.

Mo., Kansas City—CHURCH—Boone Presbyterian Church, c/o Rev. Norman Krebbs, 8752 Sleepy Hollow Rd., plans by Edw. Tanner, 310 Ward Parkway, Kansas City 2, Mo., church, $400,000.

▲ **N. J., Gloucester City**—RESIDENTIAL DEVELOPMENT—Curtis Brooks, c/o Joseph Mitchell, Wallworth Park Apartments, Haddonfield, residential development, $1,500,000. Andrews Gieseke, 1405 W. Erie Ave., Phila., Pa., consult. engr.

N. Y., Brooklyn—BANK and OFFICE—Colonial Trust Co., 1230 Avenue of Americas, New York, Zone 20, plans by Roger Halle, 222 E. 46 St., New York, Zone 17, 6 story bank and office bldg. Bay Ridge and Fifth Aves., $400,000.

N. Y., Brooklyn—APARTMENT—Isadore Lehrer & Hyman Zaret, 616 Caton Ave., Zone 18, plans by Seelig & Finkelstein, 153 Pierreport St., Zone 2, 6 story apartment, 55-65 Martense St. $450,000.

▲ **N. Y., Forest Hills**—APARTMENT—Samuel Lefrak, c/o George Miller, archt., 19 W. 44 St., New York, Zone 36, 6 story apartment, 68 Ave., east of Queens Blvd. $1,000,000.

▲ **N. Y., New York**—EXCHANGE—New York Telephone Co., 140 West St., Zone 7, N. Y., plans by Voorhees Walker, Foley & Smith, 101 Park Ave., Zone 17, 5 story exchange bldg. addn., 221-27 E. 37 St. $1,000,000.

▲ **O., Mansfield**—SHOPPING CENTER—Lemley & Welsh, Manfield, plans by Raymond Loewy Corp., 488 Madison Ave., New York, N. Y. shopping center, 8 brick, steel, concrete buildings, 1,500 auto parking area, covering 165,000 sq. ft. $2,000,000. CD 2/19.

Okla., Shawnee—SCIENCE—Oklahoma Baptist University, Shawnee, plans by Nofsger & Lawrence, 2756 N. W. 23 St., Oklahoma City, science bldg. $400,000.

▲ **Tex., Dallas**—OFFICE—Leo F. Corrigan, 2008 Mercantile Bank Bldg., office, $2,600,000.

▲ **Tex., Houston**—DWELLINGS—Ben A. & Earl N. Gilbert, 5601 Airline Dr., Job. 1, 40 dwellings, $300,000; Job 2, 50 dwellings, $375,000; Job 3, 45 dwellings, $337,500; Job 4, 38 dwellings, $300,000; Job 5, 27 dwellings, $315,000 in an area of Greenwood Village off 11,000 blk. Humble Rd.

Tex., Houston—DWELLINGS—Howard Housing Co., 9104 Main St., 38 brick, stone, cedar shake type dwellings, $570,000.

Tex., Houston—DWELLINGS—Frank W. Sharp, 2307 River Oakes Blvd., 40 addnl. brick veneer dwellings in area of Lamar-Wesleyan Addn., air conditioning. $700,000.

▲ **Tex., Houston**—DWELLINGS—Western Supply Co., West Bldg., Proj. 2, 30 dwellings, $310,000; Proj. 3, 55 dwellings, $400,000; Proj. 4, 40 dwellings, $325,000; Proj. 5, 50 dwellings, $310,000; Proj. 6, 35 dwellings, $300,000 in area in Westwood subdivision off Stella Link Rd.

▲ **Tex., Mineral Wells**—HOUSING—Federal Housing Admin. (Housing and Home Finance Agency) Electric Bldg., Forth Worth, 150 units "Emergency" Housing. $1,125,000.

▲ **Tex., Pasadena**—DWELLINGS—Embe Building Co., 6901 Almeda Rd., Houston, plans by Dunaway & Jones, 4919 Monrose Blvd., Houston, Job 2, 100 dwellings, $750,000, both on Tatar and Strawberry Rds., Job. 3, 75 dwellings, $562,500; Job 4, 125 dwellings, $947,500, both adjacent Queens Rd. and Shave Pl. Addn.; Job 5, 90 dwellings, near Pasadena Drive-In Theatre, $725,000. CD 2/25.

▲ **Tex., San Antonio**—DWELLINGS—E. J. Burke & Sons, 1100 Goliad Rd., Unit 11, 100 mostly frame dwellings, concrete slab fdn. $750,000; Unit 12, 55 frame dwellings, concrete slab fdn. $412,500; Unit 13, 45 frame, masonry dwellings, concrete slab fdn., $337,500, all foregoing in tract containing 160-acres and sub-divided into 473 building sites in Highland Hills. Reynolds Andricks, Milam Bldg., consult. engr.

Tex., San Antonio—DWELLINGS—F. J. Van Buren, 820 Chicago Blvd., 75 frame dwellings, concrete slab fdn., off Burkedale Blvd. in Highland Hills. $562,500.

▲ **Tex., Stanton**—DWELLINGS—Martin County Constr. Co., Stanton, 50 frame type dwellings, $500,000; Project 2, frame, stucco dwellings, $450,000; Project 3, frame, masonry 55 dwellings, $550,000.

INDUSTRIAL BUILDINGS

▲ **Ala., McIntosh**—PLANT—Geigy Chemical Co., Inc., Basil, Switzerland, chemical plant. Approx. $1,000,000.

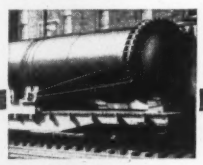
Ala., Russellville—PLANT—Sloss-Sheffield Steel & Iron Co., Russellville, plant addns. $750,000.

▲ **Ark., Jonesboro**—POWER PLANT—Jonesboro Water & Light Plant, Jonesboro, constr., instal. 7,500 kw. power plant. $1,000,000.

▲ **Calif., La Habra**—PLANT—Beckman Instruments, Inc., 820 Mission St., South Pasadena, replace plant at Imperial Blvd. and Hy. 101. $1,000,000.

▲ **Ill., Blue Island**—REFINERY—Martin Oil Co., Blue Island, oil refinery, 131 and Kedzie Sts., $3,000,000.

Me., Portland—WAREHOUSE—Union Mutual Life Insurance Co., 396 Congress St., warehouse, Read St.



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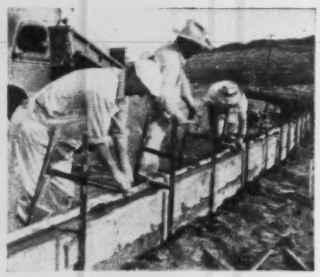
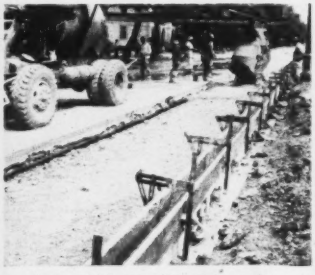


Clearwater River Bridge, Lewiston, Idaho. Contractor: Hansen & Parr



Highway job near New Orleans, La. Contractor: A. N. Goldberg, Inc.

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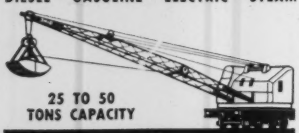

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Mass., Pittsfield—FACTORY—General Electric Co., 100 Woodlawn Ave., factory, Woodlawn Ave. **$500,000.**

Mo., Lambert Field (St. Louis 21, P. O.)—LABORATORY McDonnell Aircraft Corp., Lambert-St. Louis Municipal Airport, Robertson, engineering laboratory on 28.7 acres site. **$500,000.**

O., Springfield—FEED MILL, etc.—Farm Bureau Cooperative Assn., 821 N. Belmont Ave., Springfield, modernization expansion of feed mill to provide new method of processing of soybeans, truck loading facilities addn., warehouse. **$300,000.** Richard R. Cochran, 245 N. High St., Columbus, plant engr.

▲ **O., Warren**—PLANT—Copperweld Steel Co., Frick Bldg., Pittsburgh, Pa., high-alloy seamless tubing plant. **$10,000,000.**

▲ **O., Youngstown**—REPAIR SHOP—Erie R. R. Co., I. H. Schram, ch. engr. Midland Bldg., Cleveland, Zone 15, 2 story with 2 bays, 128x170 ft., brick lower and metal siding upper diesel-electric locomotive repair shop at Brier Hill Yards, **$1,000,000-$1,500,000.**

▲ **Okla., Ardmore**—REFINERY—Bell Oil & Gas Co., National Bank Tulsa Bldg., Tulsa, enlarging refinery, **$2,000,000,** Refinery Engineering Co., Wright Bldg., Tulsa, consult. engr.

▲ **Tenn., Cleveland**—MILL—Bowater Southern Paper Corp., 250 Park Ave., New York, N. Y., paper mill, **$51,500,000.** J. E. Sirrine Co., 215 Main St., Greenville, S. C., consult. engr. CD 8/1.

▲ **Tenn., Memphis**—WAREHOUSE—Orgill Bros. & Co., 36 W. Calhoun Ave., warehouse, **$2,000,000.**

Tex., Dallas—WAREHOUSE, etc.—Graham-Brown Shoe Co., 710 Main St., 60,000 sq. ft. warehouse and office, in Trinity Industrial area, **$650,000.**

▲ **Tex., Fort Worth**—SHOP, etc.—Convair Aircraft, c/o August C. Eserwein, Camp Bowie St., shop unit modification, **$900,000;** new shop unit, **$1,700,000;** extension assembly line. Approx. **$750,000;** heating plant extension **$150,000.**

▲ **Tex., Fort Worth**—PLANT—Hydro-Aire, Inc., 3000 Winona Ave., Burbank, Calif., 30,000 sq. ft. concrete-walled, temperature controlled defense plant, west of hy. 183. **$1,000,000.**

▲ **Wash., Moses Lake**—REFINERY—Utah and Idaho Sugar Co., Beneficial Life Bldg., Salt Lake City, Utah, beet sugar refinery. **$7,000,000.**

▲ **Alta., Edmonton** — FACTORY, etc. — Marshall-Wells Alberta Co. Ltd., 103 St. and 104 Ave., plans by Rule, Wynn & Rule, 11422 Jasper Ave., factory warehouse and offices. **$1,500,000.**

▲ **Ont., Port Credit** — STORAGE TANKS — Trinidad Leaseholds (Canada) Ltd., 184 Bay St., Toronto, 18 oil storage tanks. **$2,000,000.** CD 1/3/47.

▲ **Que., Varennes**—PLANT—Shawinigan Chemicals Ltd., 600 W. Dorchester St., Montreal, plant, **$7,000,000.**

▲ **Sask., Regina**—REFINERY—Imperial Oil Ltd., 56 Church St., Toronto, Ont., modernization program for refinery. **$7,000,000.** W. O. Longworthy, 300 Winnipeg St., refinery supt.

UNCLASSIFIED

Iowa—RURAL DISTRIBUTION LINES—Charlton Valley Electric Co-operative, Albia, 25 mi. rural distr. lines and completion previously approved construction, Lucas Co. **$149,000.** Brown Eng. Co., 322 K P Bldg., Des Moines, consult. engr.

Nebraska — SUB-STATIONS — Cornhusker Rural Public Power Dist., Columbus, 3 sub-stations, 1 each at Fullerton, Humphrey and Spaulding. **$600,000.** R. H. Reed & Co., Columbus, consult. engrs.

▲ **Tennessee**—TELEPHONE LINES, etc.—Inter Mountain Telephone Co., Bristol, telephone lines and facilities at Bristol. **$2,000,000.**

▲ **Texas and Louisiana**—PIPE LINE—Texas Pipe Line Co., Texas Co. Bldg., Houston, Tex., approx. 205 mi. large diam. products pipe line from near Port Arthur, Tex. to Baton Rouge, La. **$8,500,000.**

Texas—RURAL DISTRIBUTION LINES—Floyd County Rural Electric Co-operative, Floydada Tex., 143 mi. rural distr. lines, system imprvs., Floyd Co. **$160,000.**

Texas—TELEPHONE LINES—XIT Rural Telephone Co-operative, Dalhart, 654 mi. new rural pole telephone lines, **$275,000;** rehabilitation and imprv. some existing pole telephone lines, **$125,000,** Hartley and Dallam Counties.

Tex., Fort Worth—MIDWAY—Lake Worth Beach Co., c/o Jerry Starnes, pres., Jacksboro Hy., construct permanent type midway with game bldgs., parking facilities, swimming accommodations along the lake front. **$500,000.**

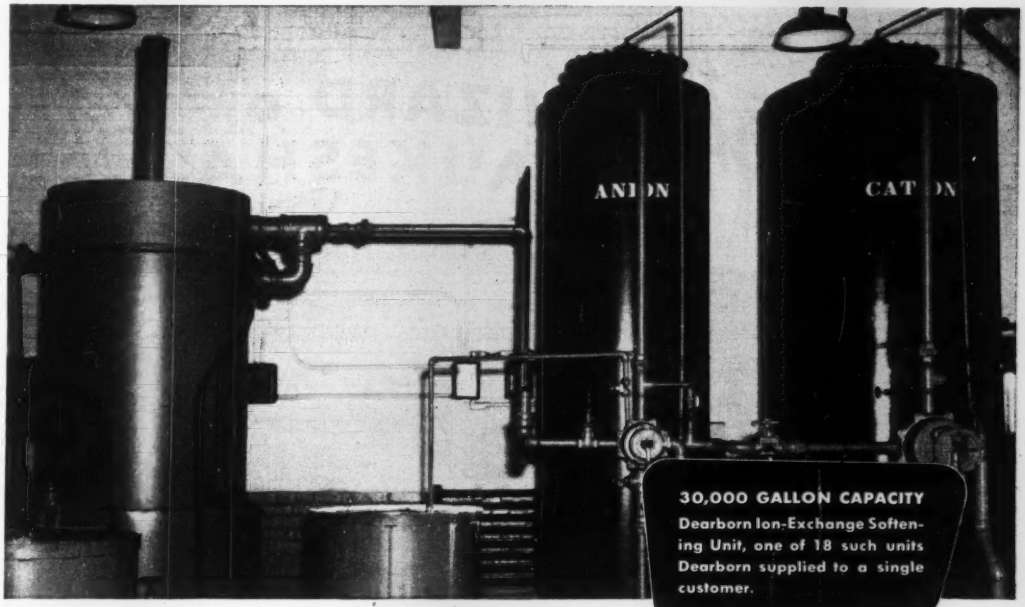
Tex., Houston—ATHLETIC FIELD—Boys Athletic Club of Houston, c/o Mrs. J. Mossler, 2605 Calumet Dr., athletic field, incl. outdoor concrete swimming pool, athletic courts, lighted ball field. **$200,000.**

Tex., Houston—RAILWAY LINE—Consolidated Chemical Industries, Inc., M. Esperson Bldg., railway short line, new plant facility units, **$127,500.**

Tex., Houston—DOCKING FACILITIES—San Jacinto Tow Boat Co., c/o Ship Channel, loading, unloading, docking facilities. **$110,000.**

Tex., Lubbock—STADIUM—Texas Technological College, Lubbock, football stadium addn. **$100,000.**

Va., Blackstone—TELEPHONE LINES—Mid-State Telephone Co-operative, Blackstone, telephone lines. **$300,000.**



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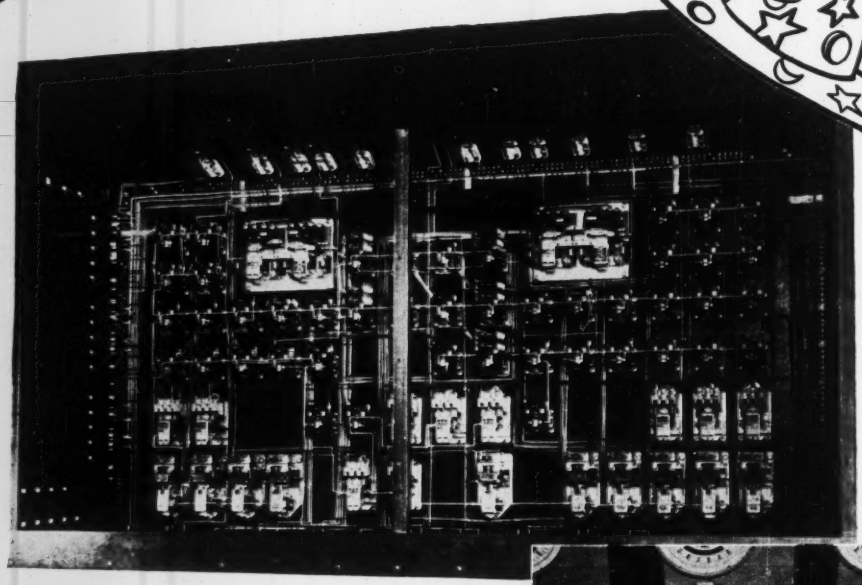

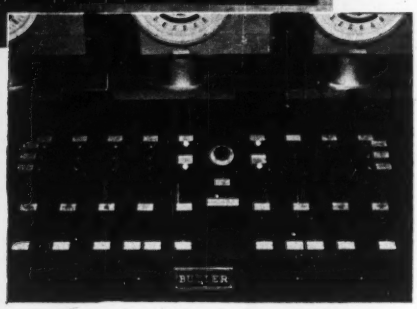

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March 9 Rhode Island

BIDS ASKED—BUILDINGS

▲ **Mass., Lowell**—HOUSING—B.A. 3/21—Lowell Housing Auth., 18 Market St., superstructure, 162 housing units and heating plant, Chelmsford St., Proj. 1-2, $1,740,000. Extended date. Krokyn & Browne, 184 Boylston St., Boston, archts. CD 2/13.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Allied Engineering Corp., 71 Proctor St., Roxbury, Mass. CA $510,451, est. $500,000. substructure Hunt's Falls Bridge, Lowell. CD 2/26, under LB.

DeFonce Constr. Co., Inc., 110 Colonial Ave., Bridgeport, Conn., LB, $467,219, sewage disposal plant, southerly portion of NAUGATUCK, CONN. Boro, Town Hall, Naugatuck, Conn. Bids Feb. 26. CD 2/1.

BUILDINGS

LOW BIDS AND CONTRACTS

MacMillan Co. Inc., 17 Main St., Keene, N. H., LB $668,357, Junior HIGH SCHOOL, Arch St., KEENE, N. H., Union School Dist., Supt. Schools, 17 Washington St., Keene, N. H. Bids Feb. 26. CD 2/19.

Rich Bros. Constr. Co., 410 Park Square Bldg., Boston, Mass. LB $657,657. Fairmount Elementary SCHOOL, Elihu Greenwood Dist., Hyde Park, BOSTON, MASS. City, Dpt. School Bldgs., Boston, Mass. Bids Feb. 27. CD 1/25.

Bossi Constr., Inc., 43 Leon St., Boston, Mass. LB $471,677. Consolidated Elementary SCHOOL, Silver St., HANOVER, MASS. Town, School Bldg. Comn., Hanover, Mass. Bids Feb. 21. CD 2/21.

Gigiando & Trubiani, Box 237, Wellesley, Mass. Owner Builds. $800,000. 80 HOUSES, River Glen Rd., WELLESLEY, MASS. Gustav Hagan, 88 Broad St., Boston, Mass., archt.

▲ **E. Turgeon Constr. Co.,** 42 Weybosset St., Providence, R. I., LB $1,084,880, RI 16-Hartford Park Exten. HOUSING, Hartford Rd., PROVIDENCE, R. I. Providence Housing Auth., 263 Chad Brown St., Providence, R. I. Bids Feb. 28. CD 2/6.

▲ **E. & F. Constr. Co.,** 94 Wells St., Bridgeport, Conn., LB, $8,094,000, MR-40 moderate rental HOUSING, Trumbull Ave. off Reservoir Ave., BRIDGEPORT, CONN. City Housing Auth., 252 Hallett St., Bridgeport Conn. Bids Feb. 28. CD 1/29.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

April 2 Delaware

STREETS AND ROADS

March 19,26 New York March 21,28 Pennsylvania
March 25 New Jersey

† **Md., Piney Point**—CONDENSATE RETURN AND EXCHANGE SYSTEM—B.A. 3/19—Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., completing condensate return and exchange sys., incl. piping, insulation, pumps and receivers, concrete constr., electrical work and painting, NOY 71710, Spec. 33113.

▲† **N. Y., Westhampton**—AIRFIELD FACILITIES—B.A. About 4/3—U. S. Eng., 80 Lafayette St., New York, Zone 13, airfield facilities, FY 1952 program, Part III and Suffolk County Air Force Base, maintenance hangar, guard house, quartermaster gas storage, BOQ and utilities. $1,200,000. Plans deposit $20. CD 12/12.

BIDS ASKED—BUILDINGS

▲ **D. C., Wash.**—HOUSING—B.A. 3/18—National Capitol Housing Auth., 1728 L St. N.W., Proj. 1-116, Highland dwellings. Extended date. CD 2/1.

▲ **N. Y., Tuckahoe**—SCHOOLS—B.A. 3/21—Bd. Educ., Town of Eastchester, Stewart Pl., Tuckahoe, high school addn., Stewart Pl. $400,000; Elementary School, Bldg. A, Mill Rd., $1,276,482; Greenvale School addn., Bldg. C, William St., $500,000, both Eastchester. CD 8/3, under LB.

▲ **N. J., Orange**—HOUSING—B.A. 4/2—Housing Auth. of City of Orange, 369 Main St., housing, Propect N.J.25-1, at Parrow St., Oakwood Ave., Wilson and Central Places; N.J. 25-2, at S. Essex Ave. Mechanic and Gray Sts., $3,300,000. Extended date. CD 11/23.

▲ **Pa., Pittsburgh**—SHOPPING CENTER—Bids Asked—Rossview Corp., 2271 Shady Ave., 1 story, 100x450 ft., brick, block shopping center, Perry Hy., Ross Twp. $1,000,000. J. E. Satterfield, R. D. 1, Trafford, Pa., archt. CD 2/5, under Pa., Ross Twp.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,
Bero Eng. & Constr. Corp., McKinley Bldg., Buffalo, N. Y. LB $2,599,124, est. $3,421,000, 9.26 mi. New York State Thruway-Ontario Sect., sub-divisions 6A, 6B and 7A, Riga-Mumford, S. H. 1284; Scottsville-Chili S. H. 5279; Beulah Rd.; Winslow Rd.; Wheatland-Center Rds.; Palmer Rd.; Baker Rd.; Cedars Ave., Union St., Sheffer Rd., OT 52-3, RC 52-22, ST 52-3, Genesee and Monroe Counties;
Auburn Constr. Co., Auburn, N. Y., LB $133,455, est. $161,000, 1.82 mi. Hammonds Corners-Tyrone C. R. 828, FA.SS. 52-3, Schuyler Co.;
Serafini Constr. Co., Inc., P. O. Box 265, Binghamton, N. Y., LB $372,307, est. $410,000, 0.82 mi. Johnson City: Rte. 17 connection, FA.SH 52-2, Broome Co.;
Collins-Forrestel Corp., Hornell, N. Y., LB $414,401, est. $493,000, 2.65 mi. Dansville-Conesus, Pts. 1, 2, and 3, SH 1574-1702, FA-RC. 52-17, Livingston Co.;
E. G. DeLia & Sons Constr. Corp., New Hartford, N. Y., LB $284,252, est. $318,000, 2.71 mi. Montezuma-Cayuga-Union Springs, Pt. 1, SH. 8518, FA.RC 52-7, Cayuga Co.;
Camarco Contractors, Inc., State Rd., Carmel, N. Y., LB $289,780, est. $327,000. 1.51 mi. Wicopee-Beekman, SH 627: Putnam County line-Stormville, Part 2, S. H. 9226, FA.RC 52-15, Dutchness Co.;
The Grandview Constr. Corp., 740 S. Fulton Ave., Mt. Vernon, N. Y., LB $1,794,153, est. $2,100,000. 11.68 mi. New York State Thruway-Catskill Sect., Sub-division 1-5, grading, drainage, C. T. 52-1, Albany Co. Bids Feb. 27. CD 2/6 and 2/7.

BUILDINGS

LOW BIDS AND CONTRACTS

Chizner Brothers, 26 Court St., Brooklyn 2, N. Y. Owner Builds. Approx. $500,000. APARTMENT for 84 families, Ocean Parkway and Avenue R, BROOKLYN, N. Y. CD 9/6.

▲ **Elmwood Gardens Homes,** c/o Stanley H. Klein, archt., 89-31, 161 St., Jamaica, N. Y., Owner Builds. $1,250,000. 122 HOUSES on tract, Hempstead Turnpike, EAST MEADOW, N. Y.

▲ **North Meadow Homes,** c/o Stanley H. Klein, archt., 89-31 161 St., Jamaica, N. Y. Owner Builds. Approx. $1,000,000. 100 HOUSES on 25 acre site, Carman Ave. and Park St., WESTBURY, N. Y.

† **Planet Constr. Corp.,** 11 W. 42 St., New York 36, N. Y. CA $468,700. addnl. dormitories at Suffolk County Air Force Base, WESTHAMPTON, N. Y. U. S. Eng., 80 Lafayette St., New York 13, N. Y. Bids Jan. 23. CD 1/3.

Gamble & Gamble, Market St., Bolivar, Pa., LB $528,500, general constr., HIGH SCHOOL addn., alterations of the Jenner-Boswell-Jennerstown Joint School Dist., BOSWELL, PA. Public School Bldg. Auth., 101 S. 25 St., Harrisburg, Pa. Bids Feb. 28. CD 1/29.

Navarro Corp., 6219 Broad St., Pittsburgh, Pa., CA. Approx. $672,400, 2 story L-shaped 61x238 ft., and 96x142 ft., brick on block Junior HIGH SCHOOL, Proj. 102-170, for Jefferson Twp. School Dist., Large, Pa. JEFFERSON TWP. (P. O. Large), PA. State Public School Bldg. Auth., 1400 N. Cameron St., Harrisburg, Pa., Bids Jan. 30. CD 2/1, under LB.

O. H. Martin Co., 18 1st St., Sharpsburg, Pa., CA. Approx. $548,817, 1 and 2 story, 50-family frame HOUSING, Project 14-6, MIDLAND, PA. Beaver Co. Housing Auth., Beaver, Pa. Bids Feb. 13. CD 2/7.

Brownsville Constr. Co., Coal Rd., Brownsville, Pa., LB $773,729, 4 story, bsmnt., 51x85 ft. and 42x26 ft. brick, limestone, steel, HOSPITAL addn., MONONGAHELA, PA. Monongahela Memorial Hospital, Monongahela, Pa. Bids Feb. 26. CD 2/8.

▲ **Albert Constr. Co.,** 1740 K St. N. W., Wash., D. C. CA $16,500,000. 1,100 single family DWELLINGS for Naval Ordnance Laboratory, WHITE OAKS, MD. NOL Employees Corporate Housing Assoc., c/o contractor. Maddox & Hopkins, 8506 Dixon Ave., Silver Spring, Md., engrs. Ross, Walton & Maddon, 3510 Rhode Island Ave., Mt. Rainier, Md., archts.

▲ **Cramer-Volmerhausen Co.,** 2601 Connecticut Ave., Wash., D. C., CA $4,924,700, Armed Forces INSTITUTE of PATHOLOGY BLDG., Walter Reed Hospital, Eng 49-080-52-32, WASH., D. C. U. S. Eng., First and Douglas Sts. N. W., Wash. 25, D. C. Bids Mar. 4. CD 1/7.

▲ **Dyker Building Co.,** 122 E. 42 St., New York, N. Y., LB $2,227,000; Alternate, $2,197,000, Richards Dwelling Housing, Project DC-1-17, WASH., D. C. National Capitol Housing Auth., 1728 L St. N.W., Wash., 25, D. C. Bids Feb. 26. CD 2/11.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

March 21 Tennessee March 26 Louisiana

STREETS AND ROADS

March 18 West Virginia March 21 Tennessee
March 26 Louisiana

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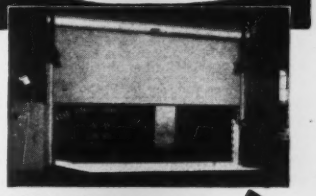

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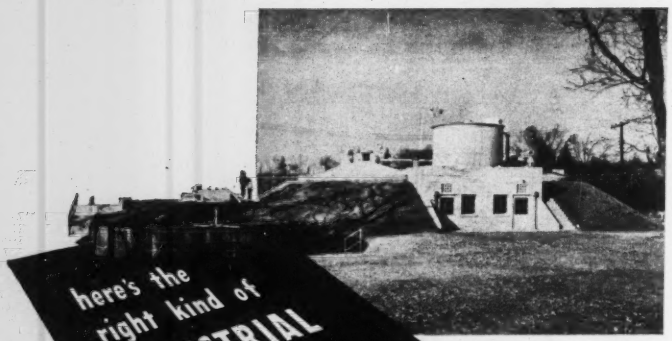

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BUILDERS—PROVIDENCE

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† J. Hilbert Sapp, Inc., P. O. Box 2053, Orlando, Fla., LB, $1,055,300, masonry coostruction, $931,060 frame construction, airmen's dormito es and mess hall, Pinecastle Air Force Base, ORLANDO, FLA. U. S. Eng., P. O. Box 4970, Jacksonville, Fla. Bids Feb. 29. CD 1/23.

LOUISIANA—State Hy. Dpt., Highway Office Bldg., Baton Rouge.

Foley & Williams, Tyler, Tex. LB $422,445. grading, rein.-con. slab span bridges, grav. base course or alternate soil cement base course bit. surf. tr., 7.461 mi. Mansfld-Naborton Hy., State Rte. 3, S.P. 21-03-09, F. A. Proj. F 189 (5), DeSota Parish. Bids Feb. 27. CD 2/13.

BUILDINGS

LOW BIDS AND CONTRACTS

P. S. West Constr. Co., Statesville, N. C. LB $459,000. 100 dwelling units in HOUSING, Project NC 17-1 and 17-2, TARBORO, N. C. Tarboro Housing Auth., Tarboro, N. C. Bids Feb. 27. CD 2/7.

Concrete Builders, Inc., 667 Spring St. N.W., Atlanta, Ga., CA, $500,000 Truck TERMINAL, ATLANTA, GA. Roadway Express, Inc., 717 Finley Ave. N.W. Atlanta, Ga.

A. C. Samford, Inc., Albany, Ga., CA, $486,410, 66 HOUSING Units, CAMILLA, GA. Camilla Housing Auth., Camilla, Ga. Bids Feb. 28.

▲ Thompson-Polizzi Constr. Co., 300 Granello Ave., Coral Gables, Fla., CA, $1,094,175, two HIGH SCHOOLS one for White and one for Negroes, FORT PIERCE, FLA. St. Lucie Co. Bd. P. Instruction, Fort Pierce, Fla. Bids Feb. 28. CD 2/6.

A. L. Sullivan, 3711 3 Ave. S., Birmingham, Ala., CA, $452,861 60 HOUSING units, FULTONDALE, ALA. Rural Housing Auth., of Jefferson County, 1005 Frank Nelson Bldg., Birmingham Ala. Bids Feb. 28. CD 1/29.

Richardson Constr. Co., 429 S. 24 St., Birmingham, Ala., CA $418,735. NURSE'S HOME, TUSCALOOSA, ALA. Druid City Hospital, Tuscaloosa, Ala. Bids Feb. 26. CD 2/16.

Dixie Building & Supply Co., Yazoo City, Miss. CA $488,000. 72 HOUSING units, YAZOO CITY, MISS. Yazoo City Housing Auth., Yazoo City, Miss. Bids Feb. 26. CD 1/29.

▲ Ditmars-Dickman Pickens Constr. Co., 3712 Okmulgee Ave., Muskogee, Okla. CA $2,116,600. 240x320 ft., brick, steel PLANT, 100x125 ft. PLANT to mfg. ontical glass for military purposes, HARRODSBURG, KY. Corning Glass Works, 1946 Crystal St., Corning, Ky.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

March 19 Michigan — March 25 Wisconsin

STREETS AND ROADS

March 19 Michigan — March 25 Wisconsin

Ill., Chicago—B.A. 3/18—City, City Hall, viaduct approach on State St. leading to State St. Bridge over Chicago River. $975,000. CD 4/9/45.

▲ Ill., Arlington Heights—B.A. 3/27—Village, Village Hall, sewage treatment works, sanitary sewers, water facilities. $1,000,000. Consoer Townsend & Assoc., 351 E. Ohio St., Chicago, Zone 11, engrs. CD 8/15.

BIDS ASKED—BUILDINGS

▲ Ill., Chicago—CHURCH—B.A. 3/19—St. Mary Magdalene Church, 8426 Marquette Ave., church, $1,000,000. R. J. Graham, 343 S. Dearborn St., Chicago, 4, Ill., engr. Geo. S. Smith, 2105 E. 71 St., Chicago, Ill., archt. CD 12/27.

▲ O., Lima—HIGH SCHOOL—B.A. 3/20—Bd. Educ., Lima, Central High School. $3,520,000. Strong, Strong & Strong, Lima, and McLaughlin & Keil, Lima, archts. CD 11/13.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

ILLINOIS—State Div. Hys., Springfield, rejected bids Feb. 15, bit. resurf. 17.62 mi. Ill. Rtes. 13 and 127, Jackson and Perry Counties, LB, $417,082. CD 2/20, under LB.

Herlihy-Mid-Continent Co., 79 W. Monroe St., Chicago 3, Ill., LB, $864,628, two-level superhighway Project Wacker Dr. between Madison and Monroe Sts., CHICAGO, ILL. City, City Hall, Chicago, Ill. Bids Feb. 28. CD 2/14.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Drost & Drost, 2107 S. Taylor Rd., Cleveland Heights 18, O., CA. $2,000,000. 10 APARTMENTS, CLEVELAND, O. Belvoir-Cliffs-Cliffview Land Co., 2071 Belvoir Blvd., Cleveland, O. Harry Sharpe & N. S. Zajack, 12336 Forest Grove Ave., Cleveland, O., archts.

Roediger Constr. Co., 1737 Euclid Ave., Cleveland 14, O., CA. $480,000. Corner's MORTUARY, OFFICE and LABORATORY, CLEVELAND, O. Cuyahoga Co., Court House, Cleveland, O. Raymond D. Devney-Garfield Harris & Robinson, 1740 E. 12 St., Cleveland 14, O., archts. Merrill-Barber-Bronson & Magee, 1900 Euclid Ave., Cleveland, O engrs. CD 11/12.

▲ **Hagerman Constr. Co.,** Strauss Bldg., Fort Wayne, Ind., CA $2,892,495, 5 story, brick, stone LIFE SCIENCE Bldg. BLOOMINGTON, IND. Indiana State University, Bloomington, Ind. Bids Jan. 31, awarded Feb. 27. CD 2/12, under LB.

▲ **Kokomo Constr. & Engr Co.,** 1768 W. Walnut St. Kokomo, Ind., CA, $2,000,000, 90 HOMES, c. conc streets, utilities, rough, fine grading, Forest Park Village, KOKOMO, IND. Ted Grusd, 1768 W Walnut St., Kokomo, Ind. CD 2/15, under CA.

▲ **Herlihy Mid-Continent Co.,** 135 S. La Salle St., Chicago, Ill., CA, $1,440,000, 150 unit APARTMENT, Oakwood and Lake Park Sts., CHICAGO, ILL. Chicago Housing Auth., 608 S. Dearborn St., Chicago 5, Ill. Bids Dec. 13, awarded Feb. 26. CD 12/27, under LB

▲ **E. C. Mahoney & Co.,** 135 S. La Salle St., Chicago, 3, Ill. Owner Builds, $5,000,000, 400 RESIDENCES macad. street paving, walks, CHICAGO, ILL. Harold A. Stahl, 111 W. Monroe St., Chicago, 3, Ill., archt. Awarded Feb. 26.

Sherman Olson, Inc., 600 W. Jackson Blvd., Chicago, 6, Ill., CA, $650,000, FACTORY, CHICAGO, ILL. Cruver Mfg. Co., 2456 W. Jackson Blvd., Chicago, Ill. Olsen & Urbain, 5 S. Wabash St., Chicago, 3, Ill., archts. Awarded Feb. 26.

Christensen Constr. Co., 7108 W. Cermak St., Berwyn, Ill. Owner Builds, $580,000, 31 RESIDENCES, Park Ave., Hanson Ave. and Burr Oak Rd. and Forest Ave., NORTH RIVERSIDE, ILL. H. Johnson, 327 S. La Salle St., Chicago, 4, Ill., archt. Awarded Feb. 25.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

Missouri—TRANSMISSION LINES—B.A. 3/26—Northwest Electric Power Co-operative, Cameron, 117 mi. transmission lines, Caldwell, Livingston, Carroll, Chariton, Ray and Clinton Counties, $500,000, Henningson, Durham & Richardson, Standard Oil Bldg., Omaha, Neb., engrs. CD 12/7-51.

South Dakota—RURAL DISTRIBUTION LINES—B.A. 3/26—West River Electric Assn., Wall, 398 mi. rural distr. lines, Meade and Pennington Counties. $500,000. Flahart & Colgan, 607½ St. Joe St., Rapid City, archts.

BIDS ASKED—BUILDINGS

▲ **Mo., Kansas City**—HOUSING—B.A. 3/20—Kansas City Housing Auth., c/o Paul R. McCauley, exec. dir., City Hall, 462 housing units, Theron B. Watkins Homes, 12 to 14 Sts., Paseo to Woodland Sts. $5,628,850. Plans deposit $50. Extended date Neville, Sharp & Simon, 25 E. 12 St., Kansas City, Mo., archts. CD 2/1.

Tex., Rusk—HOSPITAL—B.A. 3/26—Bd. for Texas State Hospitals & Schools, 45 and Lamar Sts., Austin, 3 story, 83x129 ft. receiving and treatment bldg. at Rusk State Hospital, 2 electric elevators, etc. $800,000. Shirley Simons & Sons, 1723 S. Broadawy, Tyler, archts. CD 11/27.

▲ **Tex., Greenville**—HOUSING—Bids Asked—Howard Homes, Inc., 1430 Life America Bldg., Dallas, 125-250 housing units. $937,500-$1,875,000.

SOON LETS CONTRACT—BUILDINGS

▲ **Tex., Houston**—PLANTS—Phillips Chemical Co. (subsidiary of Phillips Petroleum Co.) City Natl. Bank Bldg., soon lets contract, petrochemical plant unit at Adams Terminal on Ship Channel, $20,000,000; 2 story masonry administration.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

IOWA—State Hy. Comn., Ames,
Fred Carlson Co., Decorah, Ia., CA, $755,270 paving 16.172 mi. F-938 (2), Winnebago and Worth Counties. Bids Feb. 22. CD 2/29, under LB.

▲ **MISSOURI**—State Hy. Dpt., Jefferson City,
Perry McGlone Constr. Co., 1805 Grand St., Kansas City, Mo. LB $586,070, 24 ft. b. conc. 1.704 mi., Pulaski Co.; LB $536,565. 24 ft. b. conc. 3.541 mi. Pulaski Co.;
Illinois Valley Constr. Co., Ottawa, Ill. LB $82,896. 24 ft. b. conc. 0.436 mi. Marion and Ralls Counties; LB $190,591, 24 ft. b. conc. 1.45 mi. Marion and Ralls Counties;
Jos. L. Pohl Contractor, Nevada, Mo. LB $70,724, grav. or crushed stone surf. 3.094 mi. Carter and Reynolds Counties. Bids Feb. 29 CD 2/13
Fruin-Colnon Contg., 1706 Olive St., St. Louis, Mo. LB $179,741, one 101 ft. deck plate girder span, Sta. 800 plus 61, ST. LOUIS, MO. State Hy. Dpt., Jefferson City, Mo. Bids Feb. 29. CD 2/13.

▲† **NORTH DAKOTA**—U. S. Eng., Fort Lincoln, P. O. Box 300, Bismarck,
Manhattan Constr. Co., Muskogee, Okla., CA. $2,222,843, superstructure for highway bridge, Garrison Dam and Reservoir, Proj. Inv. 52-26. Bids Feb. 1. CD 2/14, under LB.
Gifford-Hill-American, Box 4335, Station A, Dallas, Tex., CA. $454,610, centrifugal water supply line, 23,000 ft. 36 in 50 ft. head along trench and 23,000 ft. 36 in. 100 ft., along trench, 23-18 in. acc. and air valve manholes, etc., AMARILLO, TEX. City, N. V. Moss, city mgr., City Hall, Amarillo, Tex. Freese & Nichols, 407 Danciger Bldg., Fort Worth, Tex., engrs. Bids Feb. 29.

▲† **E. E. Cloer, General Contractors, Inc.,** Box 9278, Fort Worth, Tex., CA. $4,561,615, Lots 1 to 5 (inclusive), for Harlingen Air Force Base facilities, Inv. No. Eng 41-243-52-40, HARLINGEN, TEX. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. Bids Feb. 21, awarded Feb. 25. CD 2/27, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Killian Constr Co., 458 S. Robberson St., Springfield, Mo. Owner Builds $400,000 40 RESIDENCES, SPRINGFIELD, MO.

▲ **Johnson-Sampson Constr Co.,** Salina, Kan. 50 HOUSING units;
Likins-Foster, 1413 S. Blackwelder Dr., Oklahoma City, Okla., 80 HOUSING units;
J. C. Michaelson, Salina, Kan., 70 HOUSING units;
Parkview Realty & Building Co., Salina, Kan. 201 HOUSING units;
Salina Homes, Inc., Henry Beck Co., First National Bank Bldg., Dallas, Tex., 150 Housing units;
Douglas Hill, 753 Merrill St., Salina, Kan., 26 HOUSING units;
Breon-Williams Agency, Salina, Kan. 9 HOUSING units, for Salina Air Force Base, SALINA, KAN. Total cost, approx. $3,000,000. Federal Housing Admin., National Bank Bldg., Topeka, Kan. CD 1/17.
▲ **Likins-Foster & Assocs.,** 1413 S. Blackwelder St., Oklahoma City, Okla. Owner Builds. $10,000,000. Rental HOUSING Development, TOPEKA, KAN.
▲ **Robert E. McKee, General Contractor, Inc.,** Box 562, El Paso, Tex., CA. $1,017,400, brick ext., concrete frame HOSPITAL annex, air-conditioning, etc., EL PASO, TEX Hotel Dieu Hospital, c/o Sister Mathilde, Administrator, 1014 N. Stanton St., El Paso, Tex. Bids Dec. 7, awarded Feb. 28. CD 12/17, under LB.
▲ **Seward & Shurtleff,** P.O. Box 10308, Fort Worth, Tex. Own Forces. Approx. $1,000,000. 116 frame, concrete sheetrock RESIDENCES, Westover Acres, FORT WORTH, TEX.
▲ **Brown & Root, Inc.,** Box 3, Houston, Tex., CA. Approx. $2,225,000. Benzine PLANT unit, near HOUSTON, TEX. Eastern State Chemical Corp. (Eastern States Petroleum Co., Inc., parent owner), Box 5008, Houston, Tex. CD 2/1.
Walter Looney & Assoc., 4500 N. Main St., Houston, Tex. Owner Builds. Approx. $435,000. 150 low-priced DWELLINGS, HOUSTON, TEX. CD 2/28.
Howard Housing Corp., 3509 N. Parkwood St., Houston, Tex., Owner Builds. Approx. $375,000. 25 DWELLINGS, HOUSTON, TEX. CD 2/25.
Milo Choate, Tyler, Tex., LB $390,654, 2 elementary SCHOOLS on North and South Sides, LONGVIEW, TEX. Longview Independent School Dist., Longview, Tex. Bids Feb. 29. CD 2/13.
Wilshire Development Co., Rittiman Rd., San Antonio, Tex., Owner Builds. Approx. $300,000. 40 DWELLINGS, SAN ANTONIO, TEX. CD 2/29.
Pew Constr. Co., Missoula, Mont. CA $519,057. general contract men's DORMITORY, State University, MISSOULA, MONT. State, Bd. Examiners, Helena, Mont. CD 2/28, under LB.

ZONOLITE® PLASTER AGGREGATE beats tough time limit—*saves money* as well!

The new, 48,000 sq. ft. Oakland Blue Cross office building was occupied only 195 days after ground-breaking! The plastering contractor on this high speed California job took over after another firm found the time limits too tough. Using Zonolite vermiculite Plaster Aggregate for the first time . . . he completed the job on time . . . kept costs *below* the estimate. In business 27 years, he had never seen such a large job go so smoothly . . . and Zonolite gets a good share of the credit.

Zonolite Plaster cuts handling time, is more easily mixed and applied. Droppings are fewer, workers are less fatigued using Zonolite. Weighing only one-tenth as much as sand plaster, it has almost 3½ times greater insulating value.

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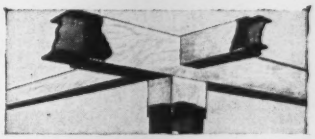
Confer & Willis, Archs. • Hamilton & Williges, Eng. • Swinerton & Walberg Co., General Cont. • Murphy Bros., Plastering Cont.



Zonolite Fireproofing Slashes Dead Weight, Cuts Costs
Zonolite plaster gives you low cost, lightweight fire protection for steel beams, columns, floors and ceilings. Zonolite fireproofing has been accorded 4-hour fire ratings for numerous applications. Wherever you need maximum fire resistance . . . with *lightweight* and low cost—specify Zonolite vermiculite plaster aggregate.

Write today for complete up-to-date information and summary of fire tests on Zonolite vermiculite plaster, the full story of this money-saving new way to build better in less time with Zonolite plaster.

ZONOLITE COMPANY, Dept. ENR-32
135 S. La Salle Street • Chicago 3, Illinois

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135 S. La Salle Street, Chicago 3, Illinois
Please send me free information about Zonolite Plaster Aggregate.

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Street.....
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add **STRENGTH** plus *Beauty*

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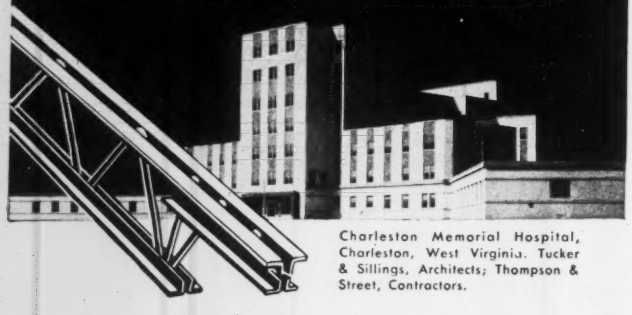

Charleston Memorial Hospital, Charleston, West Virginia. Tucker & Sillings, Architects; Thompson & Street, Contractors.

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FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

STREETS AND ROADS

March 26 California

BIDS ASKED—BUILDINGS

▲ **Calif., Sacramento**—HOUSING—B.A. 3/25—U. S. Eng., 180 New Montgomery St., San Francisco, construct, manage and finance 133 housing units at Sacramento Signal Depot, Serv. 136-80007-Army 3 $1,251,815. Barovetto & Thomas, 718 Alhambra Blvd., Sacramento, Calif., archts. CD 1/3/51.

† **Calif., Camp Pendleton**—WAREHOUSES—B.A. 3/27—Eleventh Naval Dist., San Diego, eight 92x486 ft., concrete warehouses, Spec. 32624. $500,000. Plans deposit $50.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **CALIFORNIA**—Bureau P. Rds., Dpt. Commerce, 1101 Flood Bldg., San Francisco,

Natt Mc Dougall Co., Pittock Block, Portland, Ore. CA, $515,620, clearing, grading, fence, etc. 7.051 mi. Klamath River, Klamath National Forest, Siskiyou Co. Bids Feb. 19, awarded Feb. 25. CD 2/28, under LB.

▲† **F. W. Case Co.**, 7700 Balboa Ave., Van Nuys, Calif., CA, $1,762,482, enclosing walls, warehouses, etc. Sharpe General Depot., Spec. 1577, Tracy Annex, LATHROP, CALIF. U. S. Eng., Wright Bldg., Sacramento, Calif. Bids Nov. 28, awarded Feb. 25. CD 12/6, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Barrett & Hilp**, 918 Harrison St., San Francisco, Calif., CA, $1,000,000, 1 story 450x1160 ft., WAREHOUSE, SEATTLE, WASH. Seattle Warehouse Co., c/o Parr-Richmond Industrial Corp., 1 Drumm St., San Francisco, Calif. Ward & Bolles, 215 Leidesdorff St., San Francisco, Calif., archts. CD 1128.

Maldon Constr. Co., Inc., 13421 San Antonio Dr., Norwalk, Calif., CA, $852,000, 92 stucco DWELLINGS, Belice, Don Julio, Los Arcos and Palo Verde Ave., Lakewood, NORTH LONG BEACH, CALIF. Lakewood Properties Ltd., 13421 San Antonio Dr., Norwalk, Calif.

Hadley-Cherry, Inc., 8754 Beverly Blvd., Los Angeles, Calif., CA, $817,800, 116 stucco DWELLINGS, Adorce St., Fairford and Graystone Aves., NORWALK, CALIF. Gardens Development Co., 612 S. Flower St., Los Angeles, Calif. Roland Russell, 612 S. Flower St., Los Angeles, Calif., archt.

CANADA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Alexander Constr. Ltd., 10436 81 Ave., Edmonton, Alta., CA Approx. $400,000 high pressure STEAM PLANT at military base PENHOLD, ALTA. Defence Construction (1951) Ltd., Kensington Bldg., Winnipeg, Man. Bids Jan. 4, awarded Feb. 23. CD 12/10.

Smith Bros & Wilson Ltd., 1267 Richards St., Vancouver, B. C., CA, $491,628, standard central heating plant at R.C.A.F. Station, VANCOUVER, B. C. Defence Constr. Ltd., 360 Homer St., Vancouver, B. C.

Claydon Co. Ltd., 290 Garry St., Winnipeg, Man., CA, approx. $400,000 high pressure steam plant for air force base, PORTAGE LA PRAIRIE, MAN. Defence Construction (1951) Ltd., Kensington Bldg., Winnipeg, Man. Awarded Feb. 22.

▲ **Steel Construction Ltd.**, Port Robinson, Ont., CA, approx $5,000,000, supply and erection steel relay towers Montreal to Toronto, QUEBEC and ONTARIO Bell Telephone Co. Ltd., Beaver Hall Hill, Montreal, Que

Smith Bros. & Wilson Ltd., Dominion Bank Bldg., Regina, Sask., CA, approx. $400,000 high pressure steam plant for air force base, MOOSE JAW, SASK. Defence Constr. (1951) Ltd., Kensington Bldg., Winnipeg, Man. Bids Jan. 4, awarded Feb. 22. CD 10/21

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Poole Constr. Co., Ltd.**, 10503 109 St., Edmonton, Alta., CA, $5,000,000, 6 main bldgs., CHEMICAL PLANT, EDMONTON, ALTA. Canadian Industries Ltd., 1135 Beaver Hill, Montreal, Que. Awarded Feb. 13. CD 8/29.

M. Sullivan & Sons Ltd., 234 Elgin St., Arnprior, Ont., CA, $424,447, LABORATORY bldg., CHALK RIVER, ONT. National Research Council, Sussex St., Ottawa, Ont. CD 4/9.

Bathe & McLellan, 81 King St., Oshawa, Ont., LB, $450,000 6 story, bsmnt., 33x100 ft., CITY HALL and CIVIC CENTER, with 2 story 100 ft. long wing, and separate council chamber unit, OSHAWA, ONT. City, F. E. Hare, city clk., City Hall, Oshawa, Ont. Bids Nov. 8. CD 10/22.

Proposal Advertisements see pp 129 to 131

OFFICIAL PROPOSALS

Bids: March 26, 1952

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on WEDNESDAY, MARCH 26, 1952 by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects; Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract is indicated below. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Cont. No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1				
		G. L. NICKERSON, Dist. Engr., 353 Broadway, Albany, N. Y.				
Sara.	D.A. 52-1	West Milton-Atomic Energy Commission Access Road Proj. A.A. 1	0.60	Found. Crse. Gravel	$1,000 Plans $10	$18,000
		DISTRICT No. 2				
		LACY KETCHUM, District Engr., 109 No. Genesee St., Utica 1, New York				
Mont.	M.T. 52-5	New York State Thruway—The Mohawk Section—Subdivision 16 (Se. Amsterdam-Pattersonville)	3.12	9" Cem. Conc. Pavt. 2 @ 25' Wide	60,000 Plans $15	1,020,000
Oneida	M.T. 52-6	New York State Thruway—The Mohawk Section—Subdivision 4 (Oneida-Verona Sta.)	3.56	9" Cem. Conc. Pavt. 2 @ 25' Wide=3.05 Mi. Misc. Work=0.51 Mi.	70,000 Plans $15	1,311,000
		DISTRICT No. 3				
		WILLIAM ROBINSON, Dist. Engr., Weigh Lock Bldg., Syracuse, New York				
Seneca	O.T. 52-5	New York State Thruway—The Ontario Section—Subdivision 1 & 2 (Ontario Co. Line—Tyre)	9.23	9" Cem. Conc. Pavt. 2 @ 25' Wide=9.06 Mi. Misc. Work=0.17 Mi.	180,000 Plans $25	3,349,000
4 Counties 2 Cities	FARC 52-13	Installation of Automatic Recording Traffic Counters in District No. 3 Proj. SWHP I(8)		Installation of 9 Automatic Record. Traffic Counters	1,200 Plans $10	21,060
		DISTRICT No. 5				
		C. R. WATERS, Dist. Engr., 65 Court St., Buffalo				
Erie	GISP 52-1	Grand Island State Parkway (West River Parkway) G.I.S.P. 49-1, G.I.S.P. 51-2P, G.I.S.P. 51-3	8.60	Roadside Improvement	2,300 Plans $10	39,000

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders".

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

Bids: April 2, 1952

Contract D020 — Maintenance Building and Additional Toll Plaza Facilities

THE DELAWARE MEMORIAL BRIDGE

Sealed proposals for construction of Maintenance Building and Additional Toll Plaza Facilities for "The Delaware Memorial Bridge" over the Delaware River near Wilmington, Delaware, will be received by the Delaware State Highway Department, at the office of the Director, Delaware Crossing Division, Administration Building, Delaware Memorial Bridge, Delaware, until 12 o'clock noon, Eastern Standard Time, April 2, 1952, at which time and place said proposals will be publicly opened and read.

The entire work involves the following:

(a) Construction of a one-story maintenance building approximately 113 by 107 feet overall, including relocation of existing gas tank and pump; automotive lift; lubrication equipment; sand storage hopper; plumbing, lighting, heating and air conditioning facilities; and other work incidental thereto.

(b) Reconstruction at Toll Plaza, including the reconstruction and extension of utility tunnel; construction of two 16 by 46-foot reinforced concrete roadway slabs; including excavation preparation of subgrade and construction of subbase; construction of two reinforced concrete toll booth islands; installation of roadway treadle frames and curb boxes; and other work incidental thereto.

(c) Construction of two metal and glass toll booths, with connecting metal canopy.

(d) Furnishing and installing toll collection and registering equipment.

(e) Furnishing and installing roadway treadle and counters.

Work on this Contract shall begin promptly after execution of the Contract. It shall be completed in accordance with the following schedule:

Work under item (b) above..July 1, 1952
Work under items (c), (d), and (e) above .....August 1, 1952
Entire Contract .....October 1, 1952

Monthly payments will be made for ninety (90) per cent of the construction completed each month.

Bidders must submit proposals upon forms provided by the Department.

Each proposal must be accompanied by an acceptable surety bond or certified check to the amount of at least ten (10) per cent of the total amount of the proposal.

The Contract will be awarded or proposals rejected within twenty (20) days from the date of opening proposals. The right is reserved to reject any or all bids.

One set of the Plans and two copies of the Specifications may be obtained from the Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, New York, after March 12, 1952, upon payment of $10.00.

Any prospective bidder who has made such a deposit may secure extra blueprint copies of the Plans upon payment of 50 cents per drawing and an extra copy of the Specifications upon payment of $2.50 per copy.

Plans and Specifications need not be returned to the Engineers, and the above payments will not be refunded.

The Plans and Specifications and other contract documents may be examined at the office of the Engineer, Howard, Needles, Tammen & Bergendoff, or at the Engineers' project office located north of and adjacent to the west abutment of the Delaware Memorial Bridge in the State of Delaware.

State Highway Department
by: J. Gordon Smith, Chairman
W. A. McWilliams, Director
Delaware Crossing Division
March 3, 1952

Bids: March 19, 1952

Soil Explorations, Contract No. Spec. SM-30

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A.M., Eastern Standard Time, on March 19, 1952 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON THE NEW YORK STATE THRUWAY, MOHAWK SECTION, SUBDIVISION NO. 1 MONTGOMERY COUNTY LINE TO ROUTE 146 TOWNSHIPS OF PRINCETOWN & ROTTERDAM, SCHENECTADY COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-30

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.

(b) G. L. Nickerson, District Engineer, 353 Broadway, Albany 1, N. Y.

(c) Charles Schaefer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids, refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's estimate of cost for this work is $29,167.50.

Proposal for this contract must be submitted in a separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,460.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

B. D. TALLAMY
Superintendent of Public Works

Bids: March 19, 1952

Foundation Investigations—Contract No. Spec. SM-31

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A.M., Eastern Standard Time, on March 19, 1952 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON THE NEW YORK STATE THRUWAY, MOHAWK SECTION, SUBDIVISION NO. 8, WHITESBORO TO UTICA WEST CITY LINE, TOWNSHIPS OF WHITESTOWN AND MARCY, ONEIDA COUNTY AND MOHAWK SECTION, SUBDIVISION NOS. 10C, 11, 12A, FORT HERKIMER TO INDIAN CASTLE, TOWNSHIPS OF GERMAN FLATS, LITTLE FALLS AND DANUBE, HERKIMER COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-31.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, N. Y.

(b) Mr. Lacy Ketchum, District Engineer, 109 North Genesee St., Utica, N. Y.

(c) Charles Schaefer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's estimate of cost for this work is $17,305.00.

Proposal for this contract must be submitted in a separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $866.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

B. D. TALLAMY
Superintendent of Public Works

(Continued on following page)

OFFICIAL PROPOSALS

Bids: March 19, 1952

New York State Highway Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on March 19, 1952, by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract is indicated below. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 2 LACY KETCHUM, 109 No. Genesee St., Utica 1, New York				
Herkimer	M.T. 52-1	N. Y. State Thruway-Mohawk Section Canalized Mohawk River-Town of German Flats	.....	Relocating of Canalized Mohawk River to provide for Construction of Mohawk Thruway	$42,500 Plans $15	$849,885
Madison	S.T. 52-8	N. Y. State Thruway-The Mohawk Section Subdivision 1 & 2 (Gr. Sep. with Pine Plains-Kirkville Rd.; Fyler Settlement Rd.; Chittenango-Lakeport Rd.; Gees Rd.; No. Main St. Canastota and Relocating of Tag St.-Seeber Rd.)	3.49	Asp. Conc. Tv. 1A Opt = 2 15 Mi. Fdtn. crse. Gravel = 1 34 Mi. 5 Sp. I-Beam 1 @ 51'-3½", 2 @ 39'-3½", 2 @ 61'-2½", 2 Sp. I-Beam @ 43'-6" & 5 Sp. Alpha I-Beam @ 89'-4", 2 Sp. I-Beam @ 36' 6" & 2 Sp. Alpha I-Beam @ 85'-5" 2 Sp. I-Beam @ 36' & 3 Sp. Alpha I-Beam @ 54', 2 Sp. I-Beam @ 36'-1½" 2 Sp. Alpha I-Beam @ 58'-10" Alpha Royalty = $669 10	60,000 Plans $50	1 132,000
Madison	M.T. 52-3 M.T.C. 52-4 S.T. 52-7	N. Y. S. Thruway-The Mohawk Section- (1 31 Access) Subdivision 2 & 3 and city of Oneida (Court St. Co. Rd.; Canastota-Durhamville Co. Rd.; Schoolhammer Rd. Cut-off)	6 60	9" Cem. Conc. Pavt. 2 @ 25' Wide & Var = 60 07 Mi. Asp. Conc. Ty. 1A Opt. = 1 62 Mi. D. S. T. Grad. Gravel = 0.22 Mi. Hy. Sep. 2 Sp. I-Beam 30' Ea. & 2 Sp. Alpha I-Beam 70' Ea. 2 Sp. Alpha I-Beam 54' Ea. Hy. Sep. 4 Sp. Alpha I-Beam 2 @ 39'-4½" & 2 @ 66'-1½" Hy. Sep. 4 Sp. Alpha I-Beam 53' 6", 2 @ 84', 53'-6" Twin Box R. C. Culv. Type Br. 2 @ 16'-3" Alpha Royalty = $1,060.16	$157,000 Plans $50	$2,849,000
		DISTRICT No. 6 H. E. BRUMM, State Office Bldg., Hornell, New York				
Steuben	R.C. 52-29	Big Flats-Gibson, S. H. 742	.....	3 Timber Check Dams	$1,000 Plans $10	$19,000

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement. Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

OFFICIAL PROPOSALS

Bids: April 16, 1952

Construction Project, New Jersey

Notice is hereby given that sealed proposals will be received by the State of New Jersey for work in connection with a construction project encompassing a Medical-Surgical-Reception Building; a Laundry Building; a Kitchen-Dining Building; a Boiler House; Connecting Tunnels and Miscellaneous Buildings for the Fourth Mental Hospital for the State of New Jersey at Winslow Township, Camden County, New Jersey.

Bids will be received in the office of the Director, Division of Purchase & Property, Room 318, State House, Trenton 7, New Jersey between the hours of 1 P.M. and 2 P.M. Eastern Standard Time on Wednesday, April 16, 1952, and will be opened and read in public immediately thereafter. No bid received after 2 P.M. will be accepted.

Separate bids will be received for:
- General Construction Work
- Structural Steel & Miscellaneous Iron Work
- Plumbing Work
- Potable Water & Fire Protection Lines
- Heating, Ventilating & Air Conditioning Work
- Electrical Work
- Electric Passenger Elevators
- Hydraulic Freight Elevator
- Food Service Equipment
- Laundry Machinery & Equipment
- Storm & Site Drainage Work

Bids must be made on prepared "Form of Proposal" and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than five (5) per cent of the total base bid or by a bid bond in like amount.

Bids not submitted on prepared "Form of Proposal" sheets or enclosed in other than specially addressed envelopes will be considered informal and will be rejected.

Form of Proposal, Instructions to Bidders, Contract Documents, Drawings and Specifications may be examined at offices of the Architect, Epple & Seaman and Leslie M. Dorfeuille Associate Architect, 901 Broad Street, Newark, New Jersey or at the office of the Director, Division of Purchase & Property, State House, Trenton, New Jersey.

The Director reserves the unrestricted right to accept or reject any or all bids or to waive informalities therein.

The successful bidders will be required to qualify for surety bond in full amount of contracts, of a company authorized to do business in the State of New Jersey.

No bid shall be withdrawn for a period of two (2) calendar months subsequent to opening of bids, without the consent of the State of New Jersey.

One set of complete documents for the proposed work may be obtained upon application to the Architect on deposit of a certified check in the amount of $100.00 drawn to the order of the Treasurer of the State of New Jersey. This deposit will be refunded to any bidder upon returning such set in good condition within ten (10) days after opening bids.

Additional sets of plans and specifications may be obtained from the Architect on deposit of a certified check in the amount of $60.80 drawn to the order of the Treasurer of the State of New Jersey. This amount will not be refunded.

A financial and Experience Questionnaire must be submitted to the Director of the Division of Purchase and Property, prior to submission of bids.

DEPARTMENT OF THE TREASURY
Division of Purchase and Property
Fred V. Ferber, Director

OFFICIAL PROPOSALS

Bids: April 24, 1952

Construction of Water Treatment Plant No. 2

FOR CITY OF FLINT MICHIGAN

Sealed proposals will be received by the City of Flint, Michigan at the office of the "Director of Purchases and Supplies", City Hall, Flint, Michigan up to 2:30 P.M., Eastern Standard Time on April 24, 1952, for the Construction of Water Treatment Plant No. 2 at the site of the present municipal waterworks, located near Stewart Avenue and Dort Highway; and immediately thereafter the bids will be publicly opened and read aloud.

The treatment plant to be constructed has a normal rated capacity of 24 M.G.D and contains 4 rectangular mixing basins, 3 circular clarifiers with domed roofs, a chemical storage and handling building and 12 filters, together with all equipment, except slow mix and clarifier equipment furnished under other contracts. The entire structure is contained in an overall area of 265 feet by 542 feet.

Approximate quantities of some of the major items are given below to indicate the general magnitude of the work.

Excavation	60,000 Cu. Yds.
Reinforced Concrete	15,000 Cu. Yds.
Brick Work	1,270 M
Structural & Misc. Steel	130 Tons

Bids are solicited on the basis of a lump sum price for the entire work, with additions or deductions for alternates as specified.

No bidder may withdraw his bid within 30 days after the date set for the opening thereof.

Each proposal shall be accompanied by a certified check or a bid bond by a recognized Surety Company, similar to a U. S. Government Standard Form Bid Bond, in the amount of not less than five percent (5%) of the amount of the bid, payable to the City of Flint, Michigan, as security for the acceptance of the contract.

The Contract Documents, including plans and specifications, are on file for public inspection and may be obtained during or after the week of March 17, 1952, at the office of the Director of Purchases and Supplies, City Hall, Flint, Michigan, or at the office of Ayres, Lewis, Norris & May, Consulting Engineers, 500 Wolverine Building, Ann Arbor, Michigan. A deposit of $50.00 will be required for each set of documents taken out. All of this deposit for the first set of documents taken out by any one bidder will be refunded upon their use in a bona fide proposal, or their return in good condition, within 10 days after the bidding date. Twenty-five dollars only, or 50 percent of the bid deposit for each additional set of documents taken out by any one bidder will be refunded upon the return of such additional documents in good condition, within ten days after the bidding date. A copy of the plans and specifications will also be on file and available for public inspection at the following locations:

Builders & Traders Exchange
2210 Park Avenue—Detroit, Michigan
Dodge Reports
548 Free Press Bldg.—Detroit, Michigan
Builders & Traders Exchange
200 Ionia, N. W.—Grand Rapids, Michigan

The right is reserved by the City to accept any bid, reject any or all bids, and to waive informalities in bidding in the interest of the City.

CITY OF FLINT, MICHIGAN
Albert C. Hull
Director of Purchases and Supplies

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3679) will be received at Davis Dam, Arizona, until April 3, 1952, for furnishing labor and materials for: 69-kv Davis switchyard and transformer circuit, Davis Dam Project. Location: Davis Dam, Arizona, approximately 30 miles west of Kingman, Arizona. Principal items are: Excavation for structure foundations 180 cu. yds.; erecting steel structures 102,000 lbs.; installing electrical wires and control and power cables 32,800 ft; constructing 3 conductor tap line with overhead ground wire 1,400 lin. ft.; and installing transformers, oil circuit breakers, disconnecting switches, and other items of equipment; and other work. Completion time 240 days. For particulars, address Bureau of Reclamation, Davis Dam, Arizona; or Building 53, Denver Federal Center, Denver, Colorado.

OFFICIAL PROPOSALS

Bids: March 19, 1952

Soil Explorations & Foundation Investigations

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A.M., eastern time, on March 19, 1952 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON THE NEW YORK STATE THRUWAY, HUDSON SECTION, SUBDIVISION 10 TUCKAHOE ROAD TO ROUTE 9 WESTCHESTER COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SH-29.

Maps, plans and specifications may be examined and obtained at:

a. Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, New York.
b. Mr. J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, New York.
c. Mr. Charles Schaefer, Department of Public Works, 270 Broadway, New York City, New York.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's estimate of cost for this work is $29,825.00.

Proposal for this contract must be submitted in a separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,492.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

B. D. TALLAMY
Superintendent of Public Works

Bids: April 2, 1952

Delaware Memorial Bridge

CONTRACT NO. 18
NEW CASTLE INTERCHANGE RAMPS AND
TOLL PLAZA MODIFICATION

Sealed proposals for construction of access ramps at New Castle Overpass, the widening of pavement and the extension of parking areas at the toll plaza for "The Delaware Memorial Bridge" over the Delaware River near Wilmington, Delaware will be received by the Delaware State Highway Department at the office of the Director, Delaware Crossing Division, Administration Building, Delaware Memorial Bridge, Wilmington, Delaware, until 12 o'clock noon Eastern Standard Time, April 2, 1952, at which time and place said proposals will be publicly opened and read.

The work involves the following principal quantities:

Selected Permeable Material	5,500 cu.yds.
Select Material	2,800 cu.yds.
Fine Aggregate for Backfill	300 tons
Earth Excavation	20,100 cu.yds.
Cement Concrete Masonry	60 cu.yds.
Cement Concrete Pavement	1,830 cu.yds.
Wire Mesh Reinforcement	640 squares
Waterbound Macadam	1,235 tons
Bituminous Cement Concrete	660 tons
Topsoil	22,500 sq.yds.
8-Inch Perforated Underdrains	1,500 lin. ft.

Work on Contract 18 shall begin promptly after the execution of the Contract. It shall be completed in accordance with the following schedule:

Cement concrete pavement and shoulders in the toll area, August 1, 1952.

Entire Contract, September 1, 1952.

Monthly payments will be made for ninety (90) per cent of the construction completed each month.

Bidders must submit proposals upon forms furnished by the Department.

Each proposal must be accompanied by an acceptable surety bond or certified check for a sum equal to at least ten (10) per cent of the total amount of the proposal.

The Contract will be awarded or proposals rejected within twenty (20) days from the date of opening proposals. The right is reserved to reject any or all bids.

One set of the Plans and two copies of the Specifications may be obtained from the Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, N. Y. after March 10, 1952 upon payment of $10.00.

Any prospective bidder who has made such a deposit may secure extra blueprint copies of the Plans upon payment of 50 cents per drawing and an extra copy of the Specifications upon payment of $2.50 per copy.

Plans and Specifications need not be returned to the Engineers, and the above payments will not be refunded.

The Plans and Specifications and other contract documents may be examined at the office of the Engineer, Howard, Needles, Tammen & Bergendoff, or at the Engineers' project office located north of and adjacent to the west abutment of the Delaware Memorial Bridge in the State of Delaware.

State Highway Department
by: J. Gordon Smith, Chairman
W. A. McWilliams, Director
Delaware Crossing Division
March 1, 1952

Bids: June 24, 1952

Roxburgh Hydro-Electric Power Project

NEW ZEALAND GOVERNMENT
MINISTRY OF WORKS
COMPLETION OF CONSTRUCTION OF DAM, SPILLWAY, POWER HOUSE AND OTHER ASSOCIATED WORKS

It is desired to engage a civil engineering contracting firm to complete construction of the Roxburgh Project.

The work is of considerable magnitude and tenders will be considered only from contractors of world-wide reputation in this class of work.

Formal tender documents will be available to interested contractors from the Secretary, Tenders Board, Ministry of Works, Box 8015, Government Buildings, Wellington, New Zealand, towards the end of April, 1952.

Tenders will close with the Secretary of the Tenders Board at 4 p.m. on Tuesday, June 24th, 1952.

Copies of a preliminary statement describing the main features of the project are available now at the New Zealand Government Trade Commissioner's Office, Dupont Circle Building, 1346 Connecticut Ave., N.W., Washington 6, D. C., and also at the New Zealand Government Travel Commissioner's Office, 153 Kearny St., San Francisco, California. This preliminary information is given now so that contractors desiring to submit tenders may make early arrangements to visit the site and gain an appreciation of local conditions.

Applications from bona fide contractors for formal documents to be despatched to them as soon as they are available for issue should be made to the Secretary of the Tenders Board at the above address.

Bids: April 1, 1952

Hackensack River Bridge, Route 25, Superstructure

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

Construction of the Superstructure for a bridge over the Hackensack River on State Highway Route 25, between Jersey City and Kearny, Hudson County, Federal Aid Project No. AT 192(2). The principal items of construction are:

Estimated:

3,340	cu. yds. Concrete in Structures
599,389	lbs. Reinforcement Steel in Structures
11,053,724	lbs. Structural Carbon Steel
887,400	lbs. Structural Silicon Steel
147,316	lbs. Cast Steel
19,840	sq. ft. Steel Grating
164,200	lbs. Wire Ropes, Connections & Deflectors
361,800	lbs. Sheaves, Shafts & Bearings
137,230	lbs. Span Operating Equipment
25,800	lbs. Guide Rollers & Air Buffers
2	units Elevators
	Electrical Equipment for Lift Span

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Tuesday, April 1, 1952, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements and P.L. 769, 81st Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 2855 Boulevard, Jersey City, New Jersey, and 305 Washington Street, Newark, New Jersey. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway, Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: March 21, 1952

City of Miami Beach—Superstructure 63rd Street Bridge

CONTRACT 19B-1 STRUCTURAL WORK
CONTRACT 19B-2 MECHANICAL WORK
CONTRACT 19B-3 ELECTRICAL WORK
SUPERSTRUCTURE BASCULE SPAN
63RD STREET BRIDGE.
OFFICE OF THE CITY MANAGER
Miami Beach, Florida
February 29, 1952

Sealed proposals will be received at the above office until 10:30 A.M. on the 21st day of March, 1952, at which time and place they will be publicly opened, for furnishing materials, equipment, fabricating, shop painting and delivery f.o.b. Miami, Florida, for the City of Miami Beach, County of Dade, State of Florida, as required to be furnished by the City Council of said City, the following items for the superstructure of the bascule span of the 63rd Street bridge:

Item 1. Structural Work
Item 2. Mechanical Work
Item 3. Electrical Work

Proposals may be submitted for any Item separately, or for any combination of Items.

All work is to be done in accordance with the Plans, Definitions, General Provisions, Special Provisions, Specifications, and Proposal and Contract of the City of Miami Beach.

A certified check or bid bond in the amount of five percent of the total amount of the Proposal, and made payable to the City Clerk, must accompany each Proposal.

Plans and Specifications may be obtained upon request at the Office of the City Engineer, Second Floor, City of Miami Beach, City Hall, Miami Beach, Florida.

The right is reserved to reject any or all bids.

CITY COUNCIL, CITY OF MIAMI BEACH
(signed) C. W. Tomlinson
City Clerk

WANTED
ENGINEERS
C.E. or M.E.

We are an established and fast growing industrial organization located on the Eastern Seaboard.

We have several permanent openings for men with industrial and commercial experience pipe tank or liquid storage type of construction.

The men we seek must not only have the "know how" to do the present projects but have a growth potential to achieve executive status. Good starting salary. Replies confidential.

P-3573, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

WANTED
HEATING ENGINEER

New York manufacturer offers permanent position to man with at least 15 years experience in performing improvement, design and installation of all types automatic heating plants for homes, commercial and factory buildings. Available immediately. Good salary.

P-3572, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

WANTED
ENGINEER SPECIALIZED IN FLOOD CONTROL, IRRIGATION

Consulting Engineering Firm in Caracas, Venezuela, requires an experienced Civil Engineer with ample experience to take charge of design of flood control, irrigation and drainage for large zone south of Lake Maracaibo.

Work in Caracas Office and trips to field.

Contract one year plus extension six months.

Send complete information including age, marital status, education, detailed experience resume, references and salary desired.

APARTADO 1404, CARACAS, VENEZUELA

WANTED
Manufacturing Representative

Nationally known and advertised concern selling construction equipment replacement parts thru construction equipment and welding supply dealers and distributors has several open territories. Our employees know of this ad. Write in complete detail regarding territories covered, lines carried, personal history and reference in confidence.

RW-3505, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT: "OPPORTUNITIES" :EQUIPMENT
BUSINESS: :USED OR RESALE

UNDISPLAYED RATE

$1.50 a Line, minimum 3 lines. To figure advance payment count 5 average words as a line.
Discount of 10% is allowed if full payment is made in advance for 4 consecutive insertions.
POSITION WANTED and Individual Selling Opportunity undisplayed rate is one-half of above rate, payable in advance.
Box Numbers in care of our New York, Chicago and San Francisco Offices count as one additional line.
NEW ADVERTISEMENTS: Address N. Y. office, 330 W. 42nd St., N. Y. 36, N. Y. for March 27th issue, closing March 24th.

Replies are forwarded each day as received at each of the offices mentioned without additional charge.
EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED RATE

The advertising rate $14.25 per inch for all advertising appearing on other than a contract basis. Contract rate quoted on request.
An advertising inch is measured 5/8 inch vertically on one col., 3 col.—30 inches to a page. E.N.R.

WANTED

Estimator. At least 10 years' actual successful construction experience on sewage treatment and water works construction, and also heavy construction work. Permanent for man of proven ability. Location Western Pennsylvania. Long established heavy construction firm. Send complete dossier and picture, also sample of workmanship. Salary open.

P-3552, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

SALARIED POSITIONS $3,500—$35,000

We offer the original personal employment service (established 42 years.) Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars.

R. W. BIXBY, Inc., 272 Dun Bldg., Buffalo 2, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

CIVIL SERVICE

CIVIL ENGINEERING Draftsman (Approx. 68 vacancies). For information & notice of examination No. 6570 write Frank A. Schaefer, Secretary, Municipal Civil Service Commission, 299 Broadway, NY 7, NY.

POSITIONS VACANT

BRIDGE DESIGNERS and Draftsmen. Good pay for qualified men. Opportunities for advancement. Pleasant working conditions. Interesting projects. Apply in person or write fully stating education and experience. D. B. Steinman, Consulting Engineer, 117 Liberty Street, New York 6, N. Y.

CPA—THOROUGHLY familiar with construction accounting; steady, top salary for top man. Newark, New Jersey Territory. P-3547, Engineering News-Record.

DETAILER AND Checker experienced in making and checking installation details of piping and equipment and supervising such installations used in connection with the construction of water works and sewage treatment plant. Office near Philadelphia. State experience, references and rate expected. R. M. Luff Construction Co., Willow Grove, Pa., 'phone Willow Grove 2005, ask for Mr. Paul X. Blattler.

EXPERIENCED ESTIMATOR and Superintendent for "Gunite" Restoration and High Pressure Grouting. P-3326, Engineering News-Record.

FIELD SUPERINTENDENT—Piping. Well established Northwestern Ohio Plumbing, Heating and Piping Contractor has opening for experienced man as assistant to general field superintendent. Good future assured. Reply giving background, experience and salary expected. P-3476, Engineering News-Record.

JOB ENGINEER, experienced in industrial or central station Power Plant construction. Location Pacific Northwest with nationally known Engineering and Construction Company. State qualifications, availability and salary desired. P-3479, Engineering News-Record.

STORM DRAINAGE Engineers — Men having experience in design and preparation of drawings for Storm Drainage Systems including inlets, collection systems, interceptors and culverts. Good pay for qualified men with training and experience. Opportunity for advancement. Furnish full information regarding education, training and experience, age, references and salary required. Replies strictly confidential. Department of Public Works, Baltimore County, Towson 4, Maryland.

STRUCTURAL ENGINEER: Experienced in steel design industrial and commercial buildings by a leading Middle-West structural steel fabricating company. Excellent opportunity for qualified man. Permanent position, hospitalization, group insurance and pension plans. P-3473, Engineering News-Record.

SUPERINTENDENT—ASPHALT Plant in New Jersey, must be experienced in operation and maintenance of plant and road equipment, materials and production. Write full qualifications, references and salary. P-3349, Engineering News-Record.

POSITIONS VACANT

WANTED—CIVIL Engineer graduate, some experience in the concrete paving field, preferred, by long established engineering promotional and educational organization, to be representative in the Central New York State area. Age 25 to 40. Give resume of education, engineering experience, and salary requirements in reply. P-3599, Engineering News-Record.

WANTED—CIVIL Engineer graduate, some highway experience desirable, by long established engineering promotional and educational organization, to be a representative in the Southern New Jersey area. Age 25 to 40. Give resume of education, engineering experience, and salary requirements in reply. P-3606, Engineering News-Record.

WANTED—GRADUATE Civil Engineer, some experience in the structural and housing field preferred, by long established engineering promotional and educational organization, to be a representative in the metropolitan New York area. Age 25 to 40. Give resume of education, engineering experience, and salary requirements in reply. P-3602, Engineering News-Record.

WANTED—GRADUATE Civil or Structural engineer as field representative, Ohio, by long established engineering, promotional and educational organization. Give resume of education, engineering experience and salary requirements. Prefer age 25-45. P-3450, Engineering News-Record.

WANTED IMMEDIATELY Superintendent thoroughly experienced to supervise on large canal and levee project in Southeast. Must be good organizer, producer, know men and equipment. Write stating qualifications. P-2925, Engineering News-Record.

EMPLOYMENT SERVICE

ENGINEERS NEEDED in all fields at all levels. Salaries commensurate with experience & ability. Highly confidential service. Bring or mail 3 resumes to: Position Securing Bureau Inc. (Agency), 45 John St., N. Y. 38, N. Y.

POSITIONS WANTED

ARCHITECTURAL ENGINEERING Graduate, age 26, two years experience as structural draftsman, desires permanent position, field or office work, in South or Southeast utilizing education and experience. Particulars on request. PW-3590, Engineering News-Record.

CABLE SPLICER (wire rope), 22 yrs. exp. My shop or your job. Own tools and transportation. McGlone, Churchville, N. Y.

CHIEF DRAFTSMAN—37 Married 12 years experience Engineering and Architectural Drafting—also good illustrator. Excellent references. PW-3608, Engineering News-Record.

CHIEF ENGINEER—Structural and Architecture, 25 years experience on industrial buildings, power plants, etc. PW-3591, Engineering News-Record.

CIVIL ENGINEER, B.C.E. Two years varied experience desires permanent position with consulting firm or general contractor. Prefer Southern California or Florida. Age 27. PW-3589, Engineering News-Record.

(Continued on page 134)

DESIGNERS

Our Liberal *Profit-Sharing Bonus* in 1951 amounted to more than a half million dollars.

We need the following type of men experienced in any phase of Blast Furnace, Steel Mill and Oil Refinery Design:

Structural Designers
Concrete Designers
Electrical Designers
Piping Designers
Checkers

Positions available in our offices at Cleveland, Ohio, Union, New Jersey and Tulsa, Oklahoma.

WRITE

ARTHUR G. McKEE & CO.
2300 Chester Ave., Cleveland 1, Ohio

ENGINEERS

for design and construction of several major municipal projects. Starting Salaries: $3707, $4515, $5334, $6143, $7036 per year. Write

DETROIT CIVIL SERVICE COMMISSION
735 Randolph St. Detroit 26, Mich.

Permanent Positions Open to

ENGINEERS

. . . after training at full-time pay . . . as

Consultants in Fire Protection Engineering

to top U. S. and Canadian industry. Usual pension and other benefits. Excellent opportunities; fast-growing engineering organization.

Write complete qualifications to:
P-2807, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

ENGINEERS - INSPECTORS
CHEMISTS - GEOLOGISTS

Field and Laboratory

Experienced in Plant and Site Inspection of Concrete and Asphalt. Compaction control of Earth Fill. Foundation Drilling & Soil Tests.

DOMESTIC AND FOREIGN ASSIGNMENTS
Write in Complete Detail to

TOLEDO TESTING LABORATORY
TOLEDO, OHIO

ENGINEERS
DESIGNERS & DRAFTMEN

Electrical, Mechanical Structural & Hydraulic

Reinforced Concrete Designers & Detailers

FOR WORK ON

Industrial Plants
Paper & Textile Mills
Water Supply & Waste Disposal
Steam & Hydroelectric Power Plants
Electrical Transmission & Distribution

CHAS. T. MAIN, Inc.

80 Federal Street — **Boston 10, Mass.**
317 South Tryon St. — **Charlotte, N. C.**

RESIDENT ENGINEER

Engineer with 10 or more year's field experience to head field organization as Resident Engineer on large project to be completed in 1955 with opportunity for permanent association with large engineering concern. Applicant must be thoroughly familiar with all phases of large scale construction, coordination of work, expediting materials and reports. Must be available immediately and be willing to move to location. Salary commensurate with qualification and experience. Reply must include experience record, references and recent photograph.

P-3582, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

ENGINEERS—DESIGNERS—DRAFTSMEN

ARE YOU INTERESTED IN A CAREER SERVICE?

The division of Road Design, MARYLAND STATE ROADS COMMISSION offers *Permanent Positions* to qualified men in order to carry out its extensive construction program. This is not just another job offer. This is an opportunity to become affiliated with a forward looking state highway department next door to the National Capital. Wanted especially:

Civil Engineers—Men with graduate degrees in civil engineering.

Highway Designers and Draftsmen—Immediate openings for experienced and qualified men.

Qualified applicants will be employed immediately pending Merit System examination which will be held several months after employment. Immediate vacancies available to qualified men include:

Junior Assistant Highway Engineer II . . . . . $3660-4575 per annum
Senior Draftsman II . . . . . $3240-4050 per annum

IN ADDITION, every position with the Maryland State Roads Commission means:

1. Immediate Employment at Base Salary
2. Annual Salary Increments (over period of 5 years)
3. Merit System Protection
4. Opportunities for Advancement
5. Annual Leave with Pay (15 days, cumulative to 30)
6. Generous Sick Leave with Full Pay
7. Liberal Retirement Benefits

Address W. Phelps Thomas, Personnel Director, Maryland State Roads Commission, Tower Building, Baltimore 2, Maryland for application today.

William F. Childs, Jr., *Chief Engineer* — **Russell H. McCain**, *Chairman*

POSITIONS WANTED
(Continued from page 132)

CIVIL ENGINEER—B.S. and 1 year graduate work in municipal engineering. Age 26. 1 year as Assistant City Engineer; 2 years experience as chief of survey crews. Prefer position with city or engineering firm. Desire midwest or west. Available June. PW-3539, Engineering News-Record.

CIVIL ENGINEER, Canadian, 36, married, 3 children, 11 years railway experience in field and office, now holding responsible administrative post, desires position in the United States demanding initiative and good judgment and requiring tact and thoroughness. PW-3554, Engineering News-Record.

CIVIL ENGINEER, Canadian, 27, P. Eng. Ont. B.A. Sc., seeks foreign employment in construction. Experienced in surveying, heavy construction, also design, detailing, estimating, erection of steel structures, plant layout, reinforced concrete and timber design. Married, available Sept. '52. PW-3561, Engineering News-Record.

CIVIL ENGINEERING Graduate, 31, Registered, 4 yrs. experience field & office engineering, highways & industrial layout, also plans, survey, quantity estimating & drainage. Desire position with firm in metropolitan N. Y. PW-3555, Engineering News-Record.

CONSTRUCTION CIVIL Engineer 38, graduate. 15 years experience on irrigation projects, surveying, heavy construction, and city public works structures. Prefer position in temperate to cold climates either domestic or foreign. Minimum salary $8500. per year. PW-3542, Engineering News-Record.

DIESEL PUMP And engine mechanic, experienced in any make, married. Construction work in United States or Central America preferred. PW-3595, Engineering News-Record.

GENERAL SUPERINTENDENT 52, with a thorough experience in that capacity, on public, commercial and industrial work, including schools, hospitals, housing, power plant and government projects. Concrete and masonry specialist, with ability to minimize overhead and construction costs. Available March 15th. References. PW-3583, Engineering News-Record.

GEN. SUPT. Construction—Reg. Pro. Engineer. Full responsibility Administration and field supervision. Experienced varied type contracts and government procedures. Reinforced concrete structures. All type buildings, air bases, roads and bridges. Varied off-continent and domestic experience. Now completing 3 years South America. References. Available April First. PW-3586, Engineering News-Record.

GRADUATE CIVIL Engineer, 29, Married, 8 yrs. engineering experience, last 3 in building construction. Desires position as engineer or Asst. Supt. Prefers Northwest. PW-3607, Engineering News-Record.

MATERIALS ENGINEER 5½ years experience airfields, highways, dams. Specialist in soil mechanics, asphalt and concrete. Technical supervision laboratory, and field control. PW-3491, Engineering News-Record.

MECHANICAL ENGINEER—POL and Fuel Bulk Storage Plant designer, past experienced in mechanical engineering design problems usually associated with Civil Engineering Offices. New York area desired. PW-3544, Engineering News-Record.

PROJECT ENGINEER. Experienced in management of Design of substantial programs: Structural, Hydraulic, Transport, Sanitary, and Industrial. Age 47. M.I.T. Degree in Civil Engineering. Registered Professional Engineer. Available for challengeiner project. PW-3610, Engineering News-Record.

PROJECT MANAGER, 38, graduate engineer. Thorough knowledge of N.Y. building area. Experienced in estimating, subcontracts, superintendency, etc. Desire opportunity with growing company. PW-3597, Engineering News-Record.

PURCHASING AGENT, expediter, general office, age 38, will relocate anywhere. Exp. general construction, references. PW-3576, Engineering News-Record.

STRUCTURAL (REG.) Hydraulic engineer supervisory capacity possibly available soon. PW-3530, Engineering News-Record.

PART TIME WORK WANTED

STRUCTURAL DESIGN. Analysis and Testing time available by Civil Engineer, licensed, N. Y., now teaching. PTWW-3585, Engineering News-Record.

ESTABLISHED DISTRIBUTOR
In Southern New England
Wants Franchise for a Quality Product
. . . In the building materials field. A specialty item is preferred. We offer established and active contacts with architects, engineers and contractors.
RA-3587, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. *Forty-first year. Write today.*
WILSON *Engineering Corp.*
College House Offices - HARVARD SQUARE, CAMBRIDGE, MASS.

ENGINEERS & FOREMEN
Superintendents and Project Managers are in greater demand than ever before.
LEARN IN SPARE TIME—AT HOME
Get the practical "Know-How" . . . detail by detail from elementary material to the complex techniques of organization and management as developed and used by large successful contractors.
Learn all about Contracts & Sub-Contracts, Job Organization, Departmental Organization, Planning, Production, Tools & Equipment, Estimating, Cost Systems, Purchasing, Clerical Systems, Field System, Safety, Inspection and Industrial Relations.
Send post card today for complete outline and Free Trial Lesson.
General Superintendent
GEO. E. DEATHERAGE & SON, INC.
Registered Professional Engineers
5 E. PRESTON STREET
BALTIMORE MARYLAND

CONTRACTOR'S BUSINESS FOR SALE
Owner retiring, Central New York State
Land, large garage & separate modern office building. Equipment includes all types of equipment and tools for water, sewer and excavation work. Could include our personnel if desired.
BO-3574, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

FOR SALE
ASPHALT PLANT
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FS-3613, Engineering News-Record
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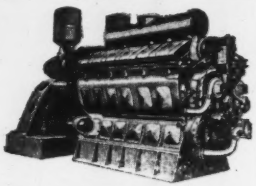

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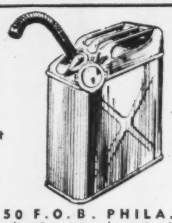

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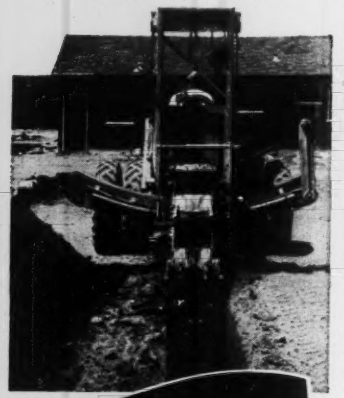

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"Guillotine" helps dismantle plant

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The Model 20-B Guillotine shown above made short work of it, however. Its cutting head weighs only 28½ lb., permitting the operator to crawl with ease throughout the structure to reach exposed rods. While it is available with power-operated hydraulic pumps, a hand-actuated hydraulic pump here supplied 45,000 lb. of thrust to the cutter and was selected as best for this particular job. The actual cutting operation on each rod took an average of eight to ten seconds. The contractor, Ragnar-Benson, Inc., of Chicago, sees many other uses for it on other potentially dangerous wrecking assignments. MANCO MANUFACTURING COMPANY, BRADLEY, ILLINOIS.

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(*Continued on page 145*)

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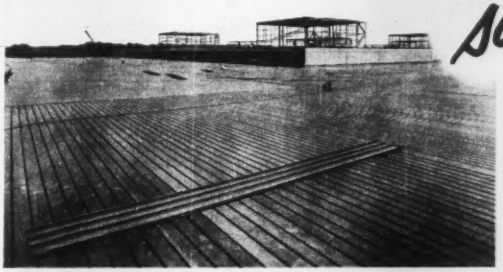
saves time!

Fastened to purlins either by clipping or by welding, as seen at top left, Wheeling Tri-Rib Steel Roof Deck goes on *fast*, saves man hours, speeds construction! Available in 18-inch widths, and in lengths up to 22 feet for maximum coverage in minimum time!



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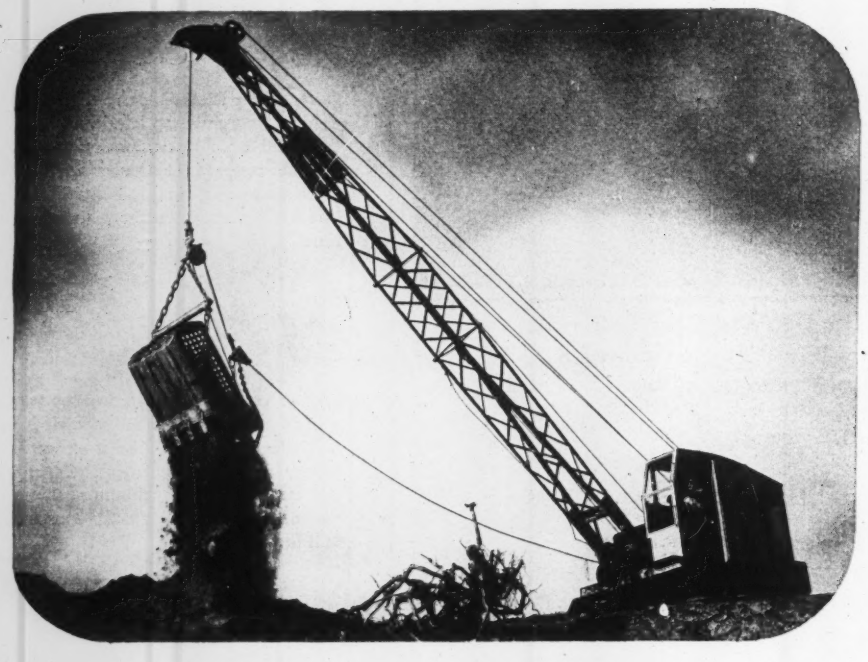


This is the most economical rope we've ever made for construction equipment

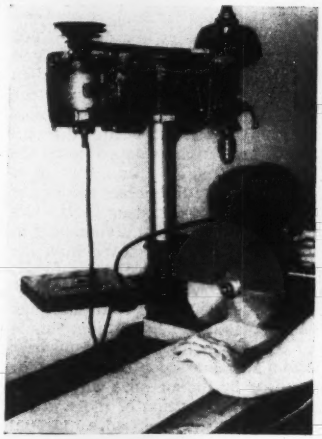
ROEBLING is the best known name in wire rope. That's partly because we were the first wire rope maker in America. But more than that, we've always led in developing better wire and better rope for every purpose.

Today's Roebling Preformed "Blue Center" Steel Wire Rope is the best choice for efficiency and long life on excavating and construction equipment. This rope has *extra* resistance to crushing and abrasion . . . stands up under rough going. It saves you time and cuts costs.

There's a Roebling wire rope of the right specification for top service on any job. Call on your Roebling Field Man for his recommendations. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

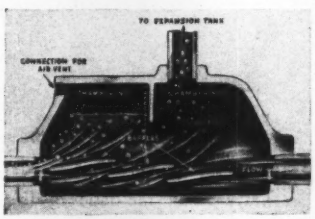
ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 701 ST. CLAIR AVE., N. E. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.



Radial arm saw fits drillpress column

A lightweight radial arm saw has been developed and placed on the market. It can be used with motors of from ½ to 1 hp depending upon individual requirements. Weighing only 50 lb minus motor, it will fit any 2¾ in. drillpress column and may be swung to one side when not in use without limiting the function of the drillpress in any way. Light enough to be set up inside a house during early stages of building for cutting studs and rafters on through interior finish, the saw takes blades up to 10 in. in diameter.

Known as the Mitermaster it was designed primarily for cut-off and dadoing operations, although it will perform many other specialized operations including rabbeting, ploughing and shaping. R. W. HENDRICK COMPANY, 11 SELMAN STREET, MARBLEHEAD, MASS.



Two new units added to Taco line

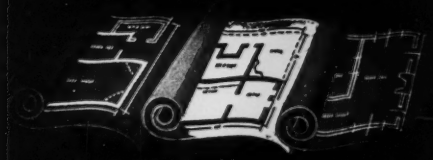
Taco Heaters, Inc., recently announced a new Air-Scoop for removing air from hot water heating systems and a new steam air valve which works on an entirely new principle.

(Continued on next page)

Sharper prints by any process!

For FREE technical Test Kit • attach coupon to company letterhead and mail

NOW! BY ANY PROCESS!



SHARPER white or blueprints!

with the world's finest, largest selling

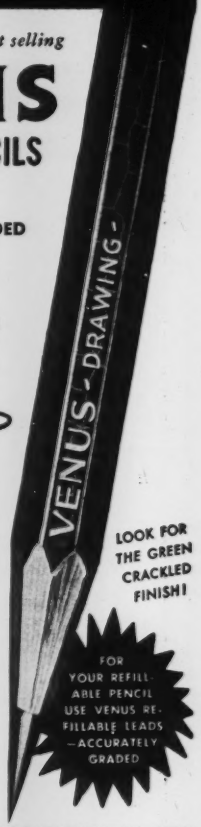
VENUS DRAWING PENCILS

- **ACCURATELY GRADED** —in 17 degrees
- **STRONGER**—the lead is *Pressure-Proofed**
- **SMOOTHER**—the lead is *Colloidal** processed

*Exclusive Venus patent

Uniform lines in weight and tone. Opaque lines for sharp, clear reproduction. Strong points, smooth in action. No smudge; no ghosts from erasures. There's the right degree for your favorite tracing papers. The result: sharper prints—*by any process!*

TRY Venus on your papers. Then see the print quality. Get Venus *Technical Test Kit* with pencils in the degrees you want . . . . . **FREE!**



LOOK FOR THE GREEN CRACKLED FINISH!

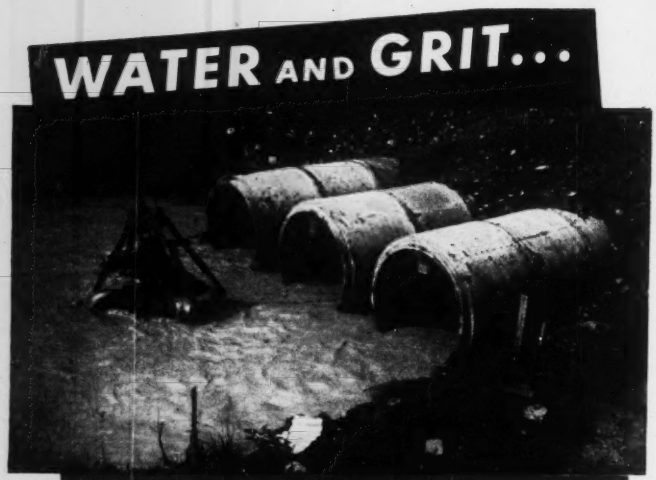
FOR YOUR REFILLABLE PENCIL USE VENUS REFILLABLE LEADS —ACCURATELY GRADED

AMERICAN PENCIL CO., HOBOKEN, N. J.

AMERICAN PENCIL COMPANY
Hoboken, New Jersey
Dept. ENR-352

Please send me free Venus *Technical Test Kit* with two Venus Drawing Pencils in these degrees: ( ) ( ).

Name .....
Company .....
Street .....
City ..... *State* .....



DON'T DAMAGE OWEN BUCKET

With a less expertly designed bucket water would likely carry abrasive sand and grit into the bearings causing excessively rapid wear and deterioration.

Not so with an Owen.

Years ago Owen engineers learned the hazards of difficult underwater service.

And through experimentation and experience they designed bearings that retard these destructive forces.

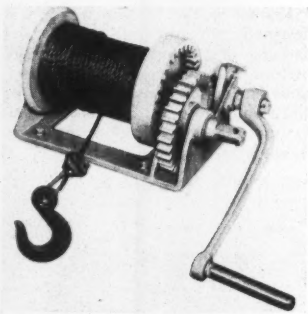
For the protection of your buckets and in your own financial interest "buy an Owen" equipped with *abrasion resisting, pressure-lubricated bearings*.

Get the interesting Owen catalog.

New Products . . .

The Air-Scoop (above) works this way: Heated water liberates air. The hotter this water is the more air it will liberate. Air, being lighter than water, will tend to travel along the upper portion of the horizontal pipe. As the air and water enter the Air-Scoop, bubbles are scooped up by the first baffle and rise into the upper chambers. Any air bubbles passing the first baffle are scooped up by the second or third. Air that accumulates in Chamber No. 1 is removed from the system by the air valve and naturally cannot return. Air from Chamber No. 2 passes into the expansion tank above to act as an air cushion. Should air completely fill this tank and back down into the scoop, excess can be removed by the air valve without disturbing the operation of the system.

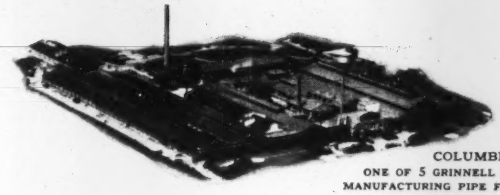
The new steam air valve measures only ¾ x 1 in., (or about one quarter the size of conventional air valves). Here's how the new valve works: Air is forced out between special composition discs by steam pressure. As the steam enters the valve, its moisture starts to swell the discs. They are sized and of such material that they will not completely seal until all air has been forced out and the valve is full of steam. After the thermostat is satisfied and steam subsides, the system may go into a vacuum for a few minutes, after which the discs dry and shrink and are ready for another cycle. TACO HEATERS, INC., 137 SOUTH STREET, PROVIDENCE 3, RHODE ISLAND.



Two-speed winch listed

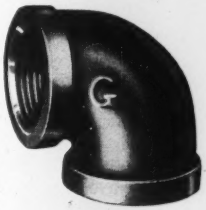
For heavy loads, the ratio of this winch is 8.16 to 1, and for light loads or fast operation it can be quickly changed to 3 to 1. In spite of its apparent small size and weight, it is ideally suited for handling heavy machinery, hand derricks, cranes, gin poles, according to the manufacturer. It can be bolted anywhere and operates in any position. A self-locking

(*Continued on page 148*)



COLUMBIA, PA.
ONE OF 5 GRINNELL PLANTS
MANUFACTURING PIPE FITTINGS

GRINNELL complete-line manufacturer of high quality PIPE FITTINGS



offers you...

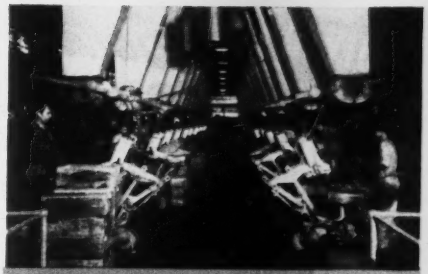
- Complete line of high quality malleable iron and cast iron pipe fittings.
- Large stocks of pipe fittings — mass-produced by skilled workers using modern equipment.
- Dependability — the result of finest materials, equipment and methods; assured by rigid production control and triple inspection.
- Coast-to-coast network of branch warehouses and distributors — making available local stocks of Grinnell pipe fittings.

WHENEVER YOU ORDER PIPE FITTINGS,
CALL YOUR NEARBY GRINNELL WAREHOUSE OR DISTRIBUTOR

ONE OF 30 GRINNELL BRANCH WAREHOUSES

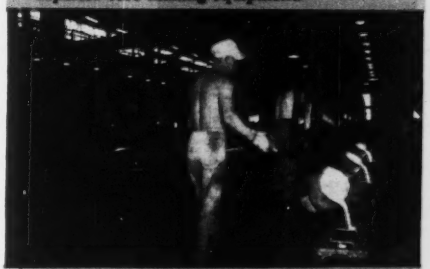
GRINNELL

WHENEVER PIPING IS INVOLVED



Dimensional accuracy assured by finest equipment and modern methods of mechanized molding.

Smooth inside finish obtained by the use of the best core sand and the employment of superior core making equipment.



Superior metal, poured into molds on continuous conveyors, gives Grinnell pipe fittings extra strength . . . extra ruggedness.

Accurate chamfer and precision threads, produced by modern tapping machines, provide easy starting and tight joints.

Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

SOLVED by NELWELD

Cost-Saving TECHNIQUE FOR SECURING INSULATION MATERIALS

Spheroids being insulated at the Gulf Oil Corporation plant, Port Arthur, Texas.

Split-second installation of Nelson insulation studs. The portable, lightweight Nelwelding gun is easily used in any position.

Impaling Foamglas blocks over pointed studs. Speed clips are then placed over protruding ends of studs to secure blocks in position.

For extremely fast, cost-saving installation of insulation materials on spheroids or any steel surface, you'll find that the Nelweld method is the answer. There's a specially engineered Nelson fastener stud for properly securing any and all types of insulation materials.

The Nelweld method also provides cost-saving techniques for the fastening of many other construction materials. For example, Nelson Approved Applicators throughout the country install industrial roofing and siding materials—corrugated asbestos, steel, aluminum, protected metal, etc.—using the top quality Nelweld method.

For securing electrical equipment, sprinkler systems, gunite reinforcement, windows, and in the fireproofing of columns, Nelweld methods are faster, better and substantially reduce costs. No capital investment in equipment is required; it may be rented at small cost by the day, week or month.

For further information, write Dept. E-3, or contact your nearest Nelson office. Nelweld Engineering Service is available coast-to-coast.

Nelson Construction Fasteners are Distributed by: United States Steel Supply Co., Reynolds Metals Co., Aluminum Company of America, Johns-Manville, Philip Carey Mfg. Co., Armstrong Cork Co., Southern States Iron Roofing Co.

Fasten it Better... at Less Cost, with NELWELD

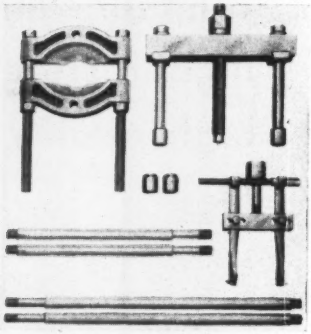
NELSON STUD WELDING

DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO

New Products . . .

feature holds the load at any desired position.

Overall dimensions are 12½ x 7½ x 7 in. Handle is 10 in. long, drum size 3-in. diameter x 6 in. long with 6-in. diameter flanges. It can hold 100 ft. of ¼-in. wire rope. Its light weight (37½ lb) makes it highly acceptable where portability is a necessity, such as in high places, small mines, etc. THE GOLD FOUNDRY & MACHINE WORKS, 1618 SOUTH OSAGE STREET, INDEPENDENCE, MISSOURI.



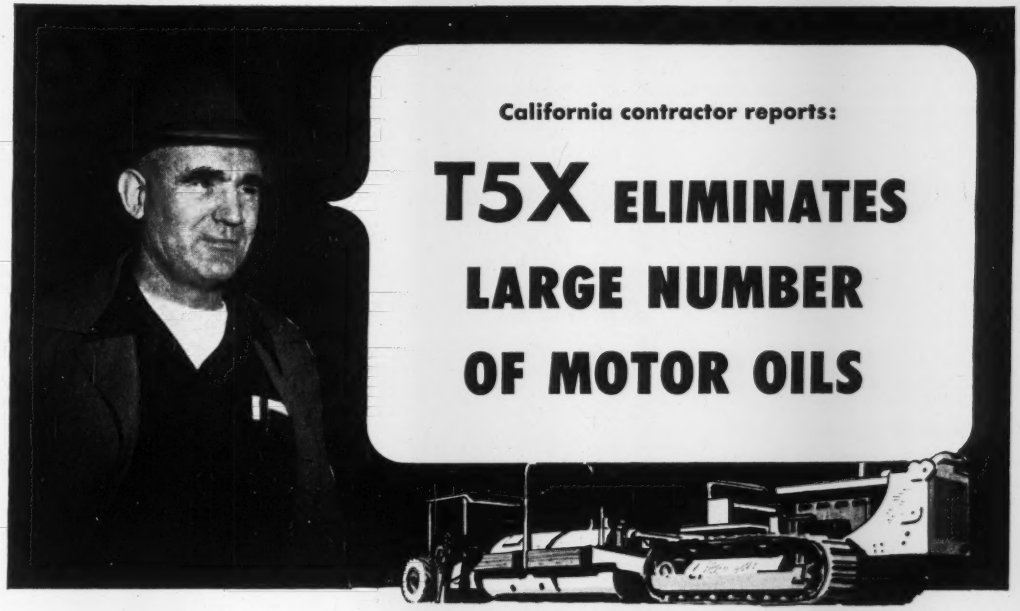
O T C Caterpillar tractor service tools

The Owatonna Tool Co. announces a new set of Caterpillar tractor service tools developed with the cooperation of Caterpillar service engineers. The set contains tools designed for use not only on the standard "cat" tractors, but also for the newer DW-20 and DW-21's.

The tools provide a wide range of utility and handle pulling and installations involving gears, bearings, pulleys, shafts, sprockets, bearing outer races, bushings, etc. Designated as Set No. CT-6, they are fully described in the OTC Bulletin CT-50. For complete information contact any OTC jobber, or the OWATONNA TOOL COMPANY, 370 CEDAR STREET, OWATONNA, MINN.

140,000-Btu heat machine

Here is a heat machine which blows warm out of its base along the floor, creating a 6-ft high heat blanket and eliminating the necessity for heating vast overhead areas in order to keep workers comfortably warm. This concentration of heat is said to reduce heating costs by as much as 90 percent. Known as the Fageol Model PW-140 the machine is said to employ an entirely new principle of



California contractor reports:

T5X ELIMINATES LARGE NUMBER OF MOTOR OILS

All-purpose superiority of amazing *purple* motor oil proved in construction fleet

Four years ago, the Cee-Tee Construction Company in Puente, Calif., changed to T5X motor oil for all of its operations. Mr. M. Patritti, one of the executives, says: "Previous to the change, we stocked a number of engine oils and were always fearful that the wrong oil might be placed in one of our units. With T5X motor oil, the fear of substitution has been eliminated completely. Incidentally, we have also effected quite a saving in warehouse space and in inventory stock..."

Construction men everywhere find that T5X motor oil protects *every* type of internal combustion engine under *every* kind of operating condition. This outstanding versatility is possible because T5X is made by blending a 100% pure, paraffin-base stock with a unique combination of additives found in no other motor oil.

Mr. Patritti continues: "In our granite quarrying operations we have a variety of equipment, including Buda and Allis Chalmers gasoline engines and Caterpillar Diesels. We keep a careful check on our oil consumption and maintenance costs. T5X is completely satisfactory for our quarry equipment and for the lubrication of dump trucks, graders, rollers, crushers, clam shells, tractors, etc."

T5X meets and exceeds the rigid Army specifications for a heavy-duty oil. This amazing *purple* oil minimizes ring sticking, sludge, lacquer and gum formation. T5X also reduces oxidation, retards carbon formation, and keeps precision-fitted moving parts covered with a protective film at all times.

Developed by the manufacturers of UNOBA —the industry's original multi-purpose grease

OFFICES

LOS ANGELES, Union Oil Building
NEW YORK, 4904 RCA Building
CHICAGO, 1612 Bankers Building
NEW ORLEANS, 917 National Bank of Commerce Building

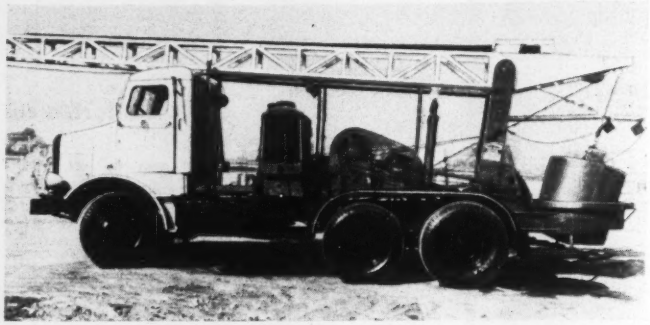
76 UNION OIL COMPANY
OF CALIFORNIA

forced aid circulation. The machine burns regular furnace type fuel oil of No. 3 or lighter grades or kerosene. Self-contained, it has an attached 6-gal fuel tank and is equipped with wheels for easy portability. Dimensions are 21x33x58 in. Weight is 245 lb.

The manufacturer recommends it for heating small factory or warehouse buildings, individual working areas, work shacks, or for drying plaster, cement, etc. When installed in canvas doghouses, it can be used to preheat tractors, compressors and other pieces of construction machinery in winter weather. FAGEOL HEAT MACHINE COMPANY, DEPT. R, DETROIT 11, MICHIGAN.

Bucket-type earth drill goes to depth of 200 ft

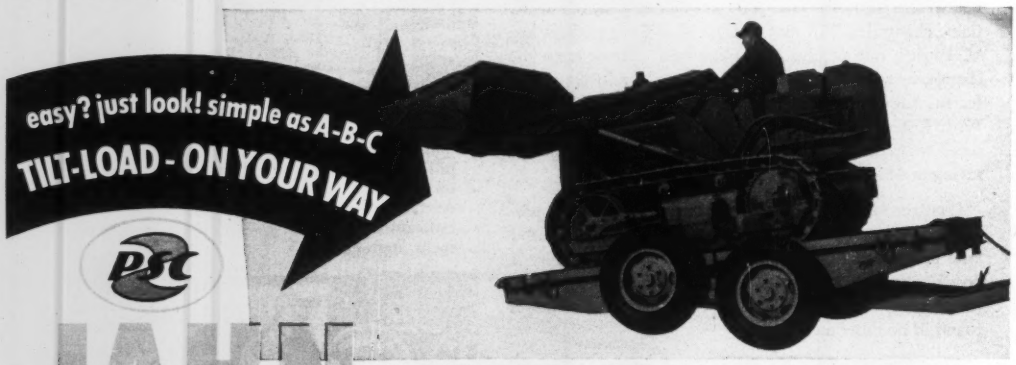
A new bucket-type earth drill (above right) which bores 16- to 84-in. holes to a depth of 200 ft is built on a skid frame and can be mounted to any truck chassis 2 tons or larger. Known as the Calweld Earth Drill Model 150-A, it is said to be able to remove 21.5 cu ft of earth per pass to speed up varied jobs required in heavy construction. It can dig caisson pier holes with belled footings, pre-bore concrete pile, drill water wells an cesspools, explore mineral deposits and test soil conditions. A variety of interchangeable bucket-drills permit boring in almost every soil condition. All controls are centered in a single unit for raising the derrick, lifting the bucket, lowering and powering the drill. Bucket may be unloaded by a simple hand-tripping operation. CALIFORNIA WELDING & BLACKSMITH SHOP INC., 7222 E. SLAUSON AVENUE, LOS ANGELES, CALIFORNIA.



Bin-level indicator

No diaphragms, false signals, intricate parts, or tricky adjustments with this new positive automatic indicator for bin levels. The Convair Bin-Vue bin level indicator consists of a 1/2000 hp motor turning at 5 rpm, and is connected to a shaft by means of a torsion spring, alongside of which is placed a limit switch. At the end of the shaft is a 4-blade paddle which is free to turn as long as material does not touch it. Once touched by material, however, the paddle stops and the motor keeps on turning until a spring, by torsion, actuates the limit switch which in turn kicks out the motor and actuates any other desired equipment. The spring is kept under torsion until material at the paddle

(Continued on page 152)



. . . a *one-man* operation from job to job. Just tilt the trailer bed, drive your equipment aboard and you're off to the next assignment. All this in a matter of minutes.

This rugged Jahn Tilt Trailer will safely and economically transport tractors, rollers, compressors, mixers and many other types of heavy construction equipment . . . a silent partner in your business of conserving man-hours and saving money.

For further information, fill in and mail attached coupon today.

THERE'S A JAHN TRAILER FOR EVERY HAULING NEED

Tandem Axle Trailers | Tandem Axle Tilt Trailers | Single Axle Trailers

PRESSED STEEL CAR COMPANY, INC.
Jahn Trailer Division
6 N. Michigan Ave. Chicago 2, Ill.
Dept. ENR

Dear Sir:
Send me literature on Jahn Trailers of the load limit checked, without obligation.

☐ 8 ton tilt ☐ 20 ton semi ☐ 25 ton semi ☐ 30 ton semi

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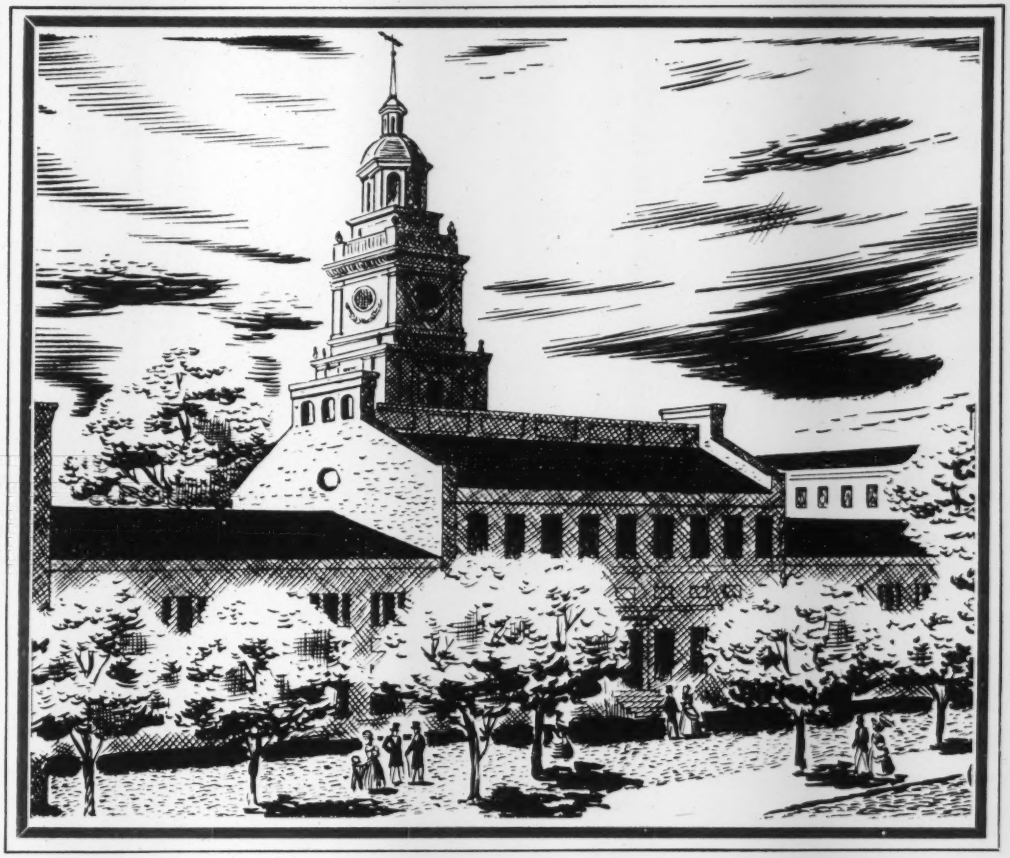
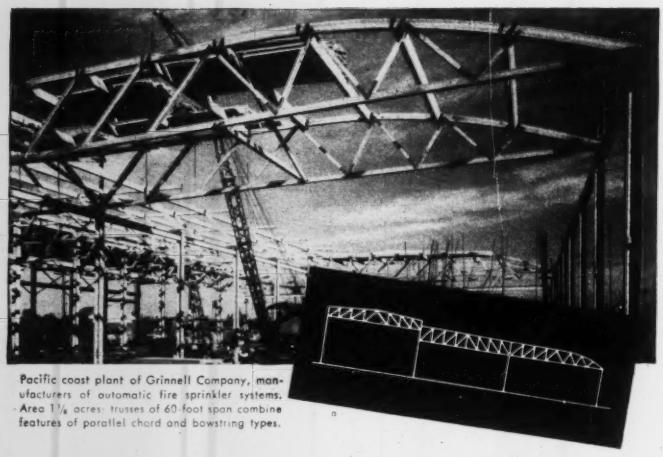


Philadelphia's Independence Hall, where the Liberty Bell is housed, as it looked 100 years ago

Philadelphia has cast iron water and gas mains in service that were laid well over a century ago. One of them is America's oldest cast iron water main, still functioning despite the radically changed conditions of street traffic and underground utility services in 100 years. The fact that cast iron pipe, laid generations ago, withstands the shock of heavy-duty traffic and the stresses caused by congested underground structures, amply demonstrates its shock-strength and beam-strength. Because of these strength factors and effective resistance to corrosion, cast iron water and gas mains, laid over 100 years ago, are still serving in the streets of more than 30 cities in the United States and Canada. **United States Pipe and Foundry Co., General Offices, Burlington, N. J. Plants and Sales Offices Throughout the U. S. A.**

U.S. CAST IRON PIPE

NUMBER EIGHT OF A SERIES



Pacific coast plant of Grinnell Company, manufacturers of automatic fire sprinkler systems. Area 1¼ acres: trusses of 60-foot span combine features of parallel chord and bowstring types.

Skeleton of a Production Tool

TRUSSES of engineered timber provide the expanse of open floor space which will make this building a primary production tool. Unhampered by an excessive number of interior posts, continuous flow of mass production is possible; materials handling equipment functions efficiently; flexibility is retained for expansion, changes of tenants, and new production processes and machinery.

Wide Range of Adaptations

Trusses in this building are typical of the adaptability of Timber Structures units. Other types provide saw tooth, flat or arched roof contours, or any desired combination of these forms. Spans may be up to 250 feet or more, and number of spans is limited only by site conditions. Local loadings such as mezzanines, balconies, monorail installations and heating and cooling units are readily accommodated in design.

Resistive to Destruction by Fire

Truss chords shown here are formed by glued lamination into single piece members, permanently free from seasoning action, and qualifying as heavy timber or mill type construction. They are naturally resistive to failure by fire and earn moderate insurance rates.

For additional information about these structural units, get a copy of the booklet, "Industrial Buildings" from your nearest Timber Structures representative, or fill in and mail the coupon.

TIMBER STRUCTURES, INC.

P. O. Box 3782-C, Portland 8, Oregon

Offices in New York, Chicago; Kansas City, Missouri; Dallas, Texas; Eugene, Oregon; Seattle and Spokane, Washington

TIMBER STRUCTURES OF CALIFORNIA • Oakland, California
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Name_____

Company_____

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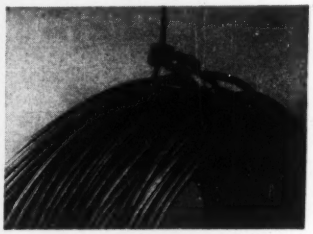
City_____ Zone_____ State_____

New Products . . .

falls away; then the paddle turns the spring away from the limit switch and again starts up the motor. By means of open or closed positions on the limit switch, any desired electrical combination can be maintained. For hazardous conditions the indicator can be supplied in an explosion-proof model. CONVAIR CORPORATION, PITTSBURGH, PENNSYLVANIA.



New choker sling fitting for wire rope

A choker sling fitting of new design has been perfected by Electroline, well-known manufacturer of wire rope products. The new fitting employs two overlapping and coacting hooks which are easily applied to a wire rope to form a loop of any desired size (see picture). The rope cannot be freed from the sling until both hooks are disengaged manually, thus preventing accidental release.

Another design feature is that the hooks are joined to the fitting portion of the choker sling fitting by a pivot which allows the unit to conform automatically to the size of the load. No matter what the diameter of a load, within capacity limits, these pivoted hooks change their relative positions to that of the fitting and thereby the fitting and cable both maintain a straight line, when under load, eliminating flexing of the cable where it enters the fitting.

They can also be furnished with a simple locking device which prevents the rope from slipping through the hooks and which will hold the rope firmly in a loop of any desired size. ELECTROLINE COMPANY, 4121 SOUTH LA SALLE STREET, CHICAGO 9, ILLINOIS.

New Products brief . . .

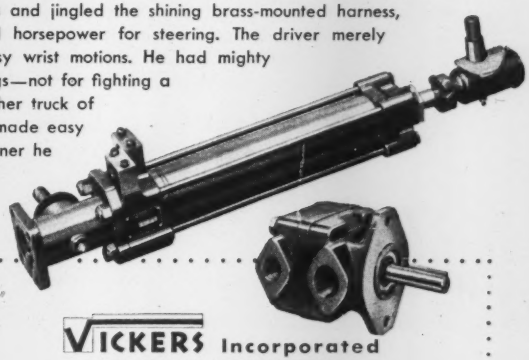
A 2 KW **light-weight generating set** with capacity of 2,000 watts at 1,800 rpm is available in ac or dc and in all standard voltages from **Sheppard Diesels, Hanover, Pennsylvania.** The unit is designed to replace as much as 1,000 lb of batteries on marine installations and weighs only 395 lb, powered by a single cylinder diesel.

Mighty muscles to wrestle kegs

but not for steering

Horse Power Did The Steering Then... *Why not now!*

Majestic brewery horses, as they nodded their gay plumes and jingled the shining brass-mounted harness, supplied horsepower for steering. The driver merely guided them with easy wrist motions. He had mighty muscles—for wrestling kegs—not for fighting a steering wheel. • The ordinary brewery truck or other truck of today has lost its horsepower for steering. Everything is made easy for the driver except the job he has to do at every corner he turns . . . when dodging traffic . . . in parking. He herds the hack by main strength, often parks with wrenching heaves. If the vehicle is very big he has to have mighty muscles, no matter what he's carrying. • And he tires on the job . . . he slows down, becomes less efficient and gets less done. • Why not have Vickers Hydraulic Power Steering on your trucks? It provides the horsepower for steering so the driver can handle any vehicle with an easy twist of the wrist. He retains his efficiency and gets more done . . . with greater safety. Get the details on Vickers Hydraulic Power Steering; write for Bulletin M-5100.



4697

VICKERS Incorporated

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Masonite Form Liner—Complete specifications for the use of Masonite Concrete Form Presdwood are contained in the center spread of an 8-page brochure which also explains what it is, where to use it and why. There's also an interesting chart which shows at a glance the deflection and span of ¼-in thick Presdwood in concrete forms. MASONITE CORPORATION, 111 WEST WASHINGTON STREET, CHICAGO 2, ILLINOIS.

Foundations—is the title of an 8-page booklet which explains concisely but completely the installation of Drilled-In Caissons on all types of structures, including power plants, warehouses, bridge piers, bulkheads, wharves and the like. Action photos show the equipment and tools involved; drawings describe test set-ups and support details; and the rear cover lists 28 major jobs including one with 366 caissons, another with maximum load of 1,420 tons on each, and still another more than 200 ft below MLW. DRILLED-IN CAISSON CORPORATION, 2 PARK AVENUE, NEW YORK 16, N. Y.

Modular Standard Building Units—The American Standards Assn and American Institute of Architects have developed a co-ordinating basis for dimensions of building materials. Besser Mfg. Co applies these recommendations and applies them to all their building units. This 28-page colored booklet describes how all block dimensions end in ⅝-in. Thus, for example a block 7⅝ x 7⅝ x 15⅝ when buttered with a ⅜-in mortar joint becomes a standard 8 x 8 x 16. The booklet shows details of bull nose, beam lintel, coping and jamb blocks as well as soffit block for floors, drain tile, chimney and pilaster blocks, and flat solid slabs for walks and terraces. Corners details and wall patterns are also included. BESSER MANUFACTURING CO., ALPENA, MICHIGAN.

Grinding wheel guards—Stress of armament activity is forcing so many plants to employ less experienced help that this company was urged by the Safety Committee of the Grinding Wheel Institute to complete its line of drawn steel wheel guards for portable, flexible shaft and bench grinders. This guard protection, always important for safety with portable tools, is now a "must" for industry. The new colorful parts brochure announces this complete line. MORRISON PRODUCTS INC., 16816 WATERLOO ROAD, CLEVELAND 10, OHIO.

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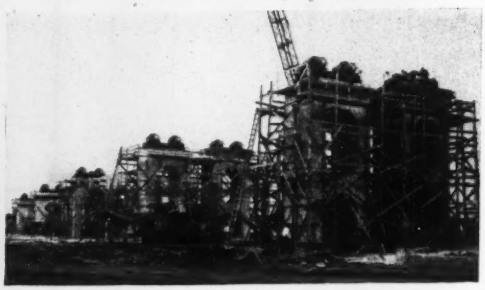

PLANT FOR TURNING SHELLS INTO CEMENT is shown here under construction. The plant is being built near Flagler Beach in Florida. The left picture shows the concrete silos for storage of cement and part of the foundations of the center plant. The right picture shows part of 284 ft of drying kiln showing the piers and the rollers in place.

Making ancient sea shells into cement is job of unique plant in Florida

The only plant in the United States using coquina shell as a base material for the manufacture of cement is being erected at Bunnell, Fla., by the Lehigh Portland Cement Co. The plant, of 1.4 million bbl annual capacity, will help relieve the cement shortage which has plagued Florida in past years.

Lehigh Portland Cement officials several years ago made the decision to erect a plant at Bunnell. After exhaustive explorations, the company had found that the most extensive deposits of coquina shell—a coarse and highly porous limestone made up of loosely cemented shells and shell fragments—were to be found in an area several miles inland from Flagler Beach, Fla.

Billions of the tiny coquina shells were washed into huge mounds years ago when most of Florida was submerged. When the ocean receded, the mounds were left on dry land. A sand overburden ranges from zero to 15 ft.

• **The raw material**—The coquina is massed in three parallel ridges, each six mi long, from 800 to 1,000 ft wide and about 50 ft deep. It is estimated that the largest of the mounds contains 5.5-million tons of coquina. The coquina is a rich source of calcium carbonate, which when mixed with low silica clays forms the raw material of portland cement.

The company acquired 10,000 acres including the coquina deposits. It also owns more than 1,800 acres of limestone and clay properties in Marion County north of Ocala, center of the Florida phosphate country, and 1,000 acres of kaolin deposits in Georgia. The Georgia clay will supplement the clays to be obtained in Florida. Lehigh also bought a 5½-acre site for a distribution plant at Jacksonville, Fla.

• **Manufacturing operations**—At first the company considered use of a continuous bucket dredge to remove coquina from the mounds, but eventually settled on the use of a dragline.

The coquina, mixed with some sand, will be loaded onto trucks and taken to the cement mill. The first operation will screen and wash the shell. This operation will also process the sand for use.

Then the shell, clay and silicious material will be ground in ball mills until the mixture will pass through a 200-mesh seive.

The plant will then blend and mix the material until the correct chemical compositions have been reached.

The rectified mixture will then be fed into sloping rotary kilns fired to 2,700 degrees to obtain a chemical reaction between the calcium carbonate in the shell, the alumina in the clay and the silica in the sand.

The material will then be cooled, and passed through another series of ball mills. At this point gypsum will be added to the clinker cement.

The finished cement will be pumped by air into 24 cone-bottom storage silos which are 80-ft high and 26 ft in diameter with 8,000 to 10,000 bbl capacities.

Regulation sized bags of cement will be filled by taps from the silos.

• **Shipping and transportation**—The plant is located along the intracoastal waterway between Bunnell and Flagler Beach about 70 mi south of Jacksonville. It is expected to supply northern Florida and part of the East Coast region which have previously been supplied from mills in Georgia and Alabama. The waterway will be used for shipping bulk cement in barges to a group of storage silos and packing house at Jacksonville. This method will tend to lower cement costs within the Jacksonville area. Most outbound cement will move by rail.

• **Design and construction**—The Lehigh plant was designed by engineers of F. L. Smidth and Co., of New York City along standard cement mill lines except for modifications peculiar to the coquina plant site. John Hundevad is resident engineer on the project.

A joint construction contract was let to Walsh Construction Co. of New York City and Duval Engineering and Contracting Co. of Jacksonville, Fla. B. B. Schwyn is construction superintendent.

An $11-million certificate of necessity was obtained to erect the plant. At the present time, the contractor has completed the 24 silos and machine and repair shops. Foundations for the inactive storage building and piers for the kiln are in place and it is expected that very shortly this unique plant will be turning out cement.

Masterbuilt Floor in Hinde & Dauch Paper Co. Box Plant, Richmond, Va. Archt.—Carneal & Johnston; General Contr.—Doyle & Russell—both of Richmond, Va.; Floor Contr.—The Vannier Co., Buffalo, N. Y.

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The good performance of Masterbuilt iron armored concrete floors in two other Hinde & Dauch plants resulted in the company's decision to install this modern industrial floor in the fine new plant shown above.

Long floor life — 4 to 6 times greater than the best plain concrete floor — is only one of the reasons why many million square feet of Masterplate Floors have been installed in plants of all types during the past twenty years.

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† spark-safe floors with 1.0 to 1.25 lbs. Masterplate per square foot of floor.

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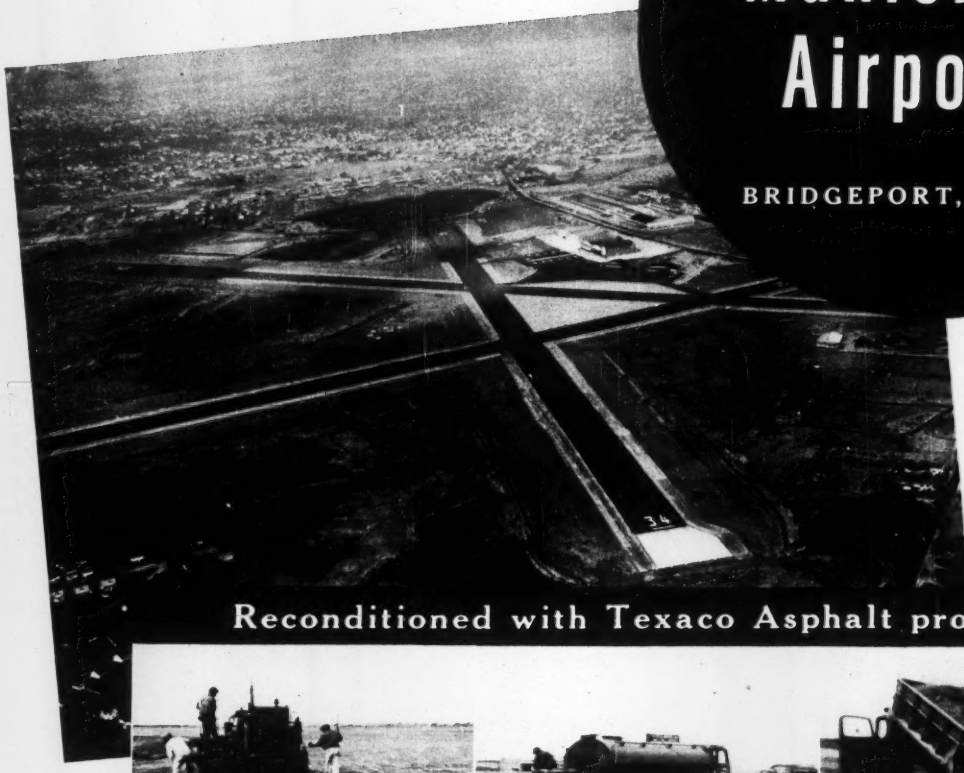

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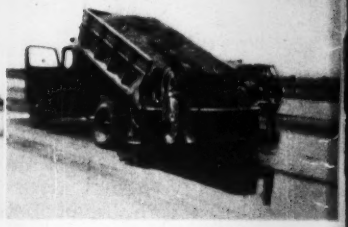

Small photographs

(left) Laying hot-mix Texaco Asphaltic Concrete paving on runway of Bridgeport Municipal Airport . . . (center) Applying seal coat of Texaco RC-2 Cutback Asphalt to runways and shoulders . . . (right) Covering seal coat with aggregate dark aggregate for runway proper, light aggregate for shoulders.

The Leverty and Hurley Co., Inc. of Bridgeport were prime contractors. Ford Brothers, Inc., of New Haven, Conn., applied Cutback Asphalt prime, tack and seal coats.

Bridgeport, one of New England's most important industrial centers, is served by this modern 3-runway airport. During the past two years, the city has carried out an extensive reconditioning program on this air field. Constructed some years ago on a filled-in salt marsh, it had settled in many places.

The runways have been brought up to grade and extended to their present 5,000-foot length with hot-mix Texaco Asphaltic Concrete. More than 15,000 tons of this resilient, heavy-duty asphalt pavement were required.

The width of Bridgeport's runways is ample, consisting of 150 feet of paving, plus a 50-foot shoulder on each side. A seal coat of Texaco RC-2 Cutback Asphalt was applied to both the runway proper and the shoulders. For greater visibility from the air, aggregates of two contrasting colors were used as cover for the seal coat — dark aggregate on the runway pavement, light aggregate on the shoulders.

Today, Bridgeport boasts a Municipal Airport which in every respect measures up to the needs of this important industrial community.

For commercial or military air fields, Texaco Asphalt products provide a variety of types of construction. Write for two helpful booklets about these types.

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